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THE PATHOLOGY OF DEATHS DURING INFLUENZA EPIDEMICS.[1]

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INFLUENZA is an acute disease of the upper respiratory tract, which occurs in epidemics and pandemics at fairly regular intervals. Epidemiologically it is characterized by a high rate of infection, but has a relatively low mortality. Fatal cases are usually confined to the higher age groups of 60 years and over, and to infants aged less than 18 months. The exception to this was experienced in the great pandemic of 1918 to 1919, when a high percentage of fatal cases occurred in young adults.

Clinically, influenza is characterized by sudden onset with headache, malaise, generalized aches and pains, prostration and sometimes with sore throat. In uncomplicated cases it is frequently of short duration. In infants and young children the disease may not be suspected by the parents, and the child may simply be found dead. Sudden death may also sometimes occur in young adults as early as the second day after the onset of symptoms. The recognition of this disease in the post-mortem room is important in cases of so-called sudden or unexpected death, particularly when the post-mortem examination is carried out by order of a coroner.

Despite the widespread nature of influenza and the available laboratory methods for isolating and identifying the virus, very few controlled studies have been made of the histopathology found in fatal cases of this disease. It is surprising that since 1933 when Smith, Andrewes and Laidlaw first isolated influenza virus, only five virologically controlled studies of the respiratory tract in fatal influenza have been made (Van Bruggen *et alii*, 1947; Straub and Mulder, 1948; Mulder and Verdonk, 1949; Hers and Mulder, 1951; and Hers, 1955).

It is the purpose of this paper to record our observations on 13 virologically proven cases of influenza examined in the post-mortem room at the Coroner's Department, Melbourne. Two of these proven cases occurred during the epidemic of 1950, which was described by Anderson *et alii* (1953), two were encountered during the epidemic of 1956 and nine during the recent (1957) epidemic of Asian influenza in Melbourne.

MATERIAL AND METHODS.

Collection of Material Post Mortem.

The post-mortem technique used for the collection of specimens was that described previously (Bowden and French, 1951). In each case swabs were taken from the

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trachea, and the bronchi were exposed by cutting across the root of the lung.

Bacteriological Examination.

Tracheal and bronchial swabs were plated on horse blood agar plates, which were subsequently incubated at 37° C. for 24 hours and the various bacteria isolated and identified by conventional methods.

Isolation of Influenza Virus.

The tracheal and bronchial swabs were extracted in nutrient broth to which penicillin and streptomycin were added; the mixture was inoculated into the amniotic cavity of 14 to 15 days old chick embryos and the virus isolated and identified as described by French and Dineen (1958).

Clinical and Pathological Observations.

The 1950 Cases.

These two cases were included in the study on unexpected death in infants reported previously, namely Cases 32 and 33 (Bowden and French, 1951). The main features found in these two cases were as follows.

Case I.—The patient was a male child aged two years, who died on arrival at hospital. He had been examined by a doctor eight hours previously, and had been treated with sulphonamide tablets for inflamed tonsils. Autopsy was performed nine and a half hours after death and revealed hæmorrhages on the surface of the kidneys and hæmorrhagic adrenals. The remaining organs were apparently normal. No significant bacteria were cultivated from the heart blood, trachea or bronchi of this child, but type A influenza virus was isolated from the trachea.

Microscopic examination revealed an acute tracheo-bronchitis. There was degeneration and destruction of the tracheal and bronchial epithelium, and in addition there was sub-epithelial hyperæmia and infiltration with inflammatory cells, many of which were plasma cells. The plasma cells were found in "nests", particularly about the mucous and serous secreting glands. These glands showed degenerative changes with desquamation of the secreting cells in most areas (Figure I). In a section of a large bronchus from this case, ducts of mucous glands opening on to the surface of the bronchus were found to be dilated and filled with degenerating desquamated cells (Figure II).

The isolation of influenza virus and the microscopic findings in this case indicated that the child had suffered from an infection with influenza virus. The hæmorrhagic condition of the adrenals also suggested a concomitant infection with the meningococcus, although we failed to recover it in culture. It is possible that in this child the influenza virus opened the way for the invasion of the blood stream by the meningococcus and that the latter was the immediate cause of death.

Case II.—The patient was a male child, aged three and a half years who was found dead by a doctor who was called to see him. There was no history of illness before he was found dead in bed. The autopsy was performed 17 hours after death; macroscopically, bilateral hæmorrhagic pleural effusion, hæmorrhagic pericarditis with effusion and a blotchy, purplish rash on the backs of the thighs was found. Microscopically, there was an acute tracheo-bronchitis with destruction of bronchial epithelium and a marked preponderance of plasma cells in the sub-epithelial tissues of the trachea and larger bronchi similar to that seen in Figures I and II. The peripheral lung itself showed extensive thickening of the interalveolar walls, where there was very marked œdema and hyperæmia, but no pneumonitis or obvious inflammation.

Influenza virus type A was isolated from the tracheal swabs, but no other significant micro-organisms were obtained from this child.

The epicardium showed acute changes with the appearance of acute pericarditis, the inflammatory cells being mainly plasma cells and macrophages. There was also myocarditis with foci of toxic degeneration of heart muscle and a mild inflammatory reaction consisting of lymphocytes, plasma cells and eosinophils.

Here, again, the actual cause of death may have been an acute meningococcal septicæmia following influenza virus infection.

The 1956 Cases.

There was a widespread epidemic of influenza in Melbourne during the months of May to September, 1956. Influenza virus was isolated during the epidemic from clinical cases and from post-mortem material and proved to be a type *A* strain (French, 1956). In two cases it was recovered from bodies examined in the mortuary of the Coroner's Department.

Case III.—The patient was a male child, aged 22 months, who was found dead in his bed by his mother; there was no history of illness. Examination showed a normally built child. Macroscopic examination of the organs did not reveal any abnormality apart from the lungs and bronchial tree, in which there was some reddening and swelling of the mucous membrane of the larynx, trachea and bronchi; there was also some œdema of the lungs.

Microscopically, the trachea and bronchi showed various stages of inflammation and degeneration. There was swelling of the epithelial cells and their nuclei with degeneration leading to desquamation. The appearance varied from normal ciliated epithelium to severe destruction of the epithelium with accompanying involvement of the *tunica propria*. In some areas of the trachea, infiltration of the epithelium with small round cells was seen (Figure III). There was marked vascularity of the sub-epithelial tissue with capillary dilatation and engorgement with blood. There was also œdema of the sub-epithelial layer and infiltration with round cells, many of which were plasma cells. Deeper down, the mucous and serous secreting glands showed degenerative changes, and in the serous cells there were granules which stained conspicuously with hæmatoxylin and eosin. There were accumulations of plasma cells between and about the glands (Figure IV). The lung parenchyma showed alveolar œdema, but the alveolar walls were intact although congested and œdematous.

In the heart there were areas where the muscle fibres showed degenerative changes varying from cloudy swelling with poor staining to complete degeneration and destruction. This myocardial damage was of a patchy nature with intervening areas of normal appearance. There was no associated cellular infiltration.

From tracheal and bronchial swabs a type A influenza virus was isolated. Growth of an almost pure culture of pneumococci was also obtained from the bronchial swab.

Case IV.—In this patient, a young adult male, type A influenza virus and *Staphylococcus aureus*, coagulase positive, were isolated from the trachea. Here the macroscopic appearance of the trachea, main bronchi and lung was typical of influenza. There was intense reddening of the mucosa with swelling and granularity and also some accompanying œdema of the lung. No detailed histological study was undertaken in this case.

The 1957 Cases of Asian Influenza.

During 1957 there was world-wide occurrence of influenza caused by a type A strain which was serologically different from all previously known strains of influenza virus. It seems likely that the first cases caused by this virus occurred in Central China about February, 1957, and that it reached the western world via Hong Kong and Singapore. During the months of June, July and August, clinical influenza was common in Melbourne, and one of us (E.L.F.) made 24 isolations of the virus from throat washings from suspected clinical cases, as well as nine isolations of the virus from post-mortem material. The following post-mortem cases were studied.

Case V.—The patient was a young woman, aged 18 years, of thin build, who was well until two days before her death when she felt "off colour" with a sore throat. This persisted till the next day, when she developed a sharp pain in the left side of the chest. On the evening of this day her temperature was 103·5° F. Her respiratory rate was rapid, but nothing was detectable clinically in the chest. She was treated with 1,500,000 units of penicillin and with "Sulphatriad". At 9 a.m. the following morning she was said to have had a sudden hæmoptysis and died.

Post-mortem examination showed a very red trachea and larynx with mucopurulent exudate and patchy sloughing of the mucosa in places. The lungs showed an acute hæmorrhagic œdema with areas of hæmorrhage in the lung substance.

Microscopically, there was coagulation necrosis of the epithelium lining the trachea and bronchi (Figure V). There was marked sub-epithelial hyperæmia and infiltration with round cells, polymorphonuclear leucocytes, eosinophils and plasma cells. The mucous and serous secreting glands showed extensive degenerative changes, and plasma cells were prominent, particularly about the deeper glands of the trachea. The lungs showed extensive hæmorrhages in the alveoli with

the interalveolar walls markedly œdematous and infiltrated with polymorphonuclear leucocytes, some eosinophils and macrophages. There were numerous colonies of cocci present in the lung parenchyma. The heart muscle also showed areas of toxic degeneration.

From tracheal and bronchial swabs, influenza type A virus Asian strain and *S. aureus*, coagulase positive, were isolated.

This was a case of influenza complicated by staphylococcal infection of the lung, and in its clinical and pathological manifestations it was similar to cases described in the 1918 pandemic (Hers, 1955).

CASE VI.—The patient was a female infant, aged 12 months, who became ill in the early hours of the morning and was taken to a doctor. The father stated that the baby had been ill for about 24 hours. The doctor considered that the child was suffering from pneumonia and arranged for her admission to hospital, where she was subsequently found to be dead.

Post-mortem examination showed some reddening of the larynx, the trachea was pale and there was œdema with hæmorrhagic areas scattered through both lungs. There were no other significant findings, apart from general congestion of the organs.

Microscopically, the epithelium of the trachea and bronchi showed irregular focal destruction. There was loss of cilia, loss of definition of the epithelial cells and in many places disappearance of the usual epithelial cell pattern with frequent reduction to the basal cell layer (Figure VI). In addition, there were areas of hæmorrhage in the *tunica propria* and marked infiltration of the sub-epithelial tissues with round cells, some of which were plasma cells and some eosinophils. In the lung parenchyma there was alveolar œdema and hæmorrhage and some small foci of round cell infiltration. The interalveolar walls were congested, thickened and œdematous. Influenza virus type A/Asian/1957 was isolated from the tracheal and bronchial swabs. No significant bacteria were cultured. This case probably represents an infection with the Asian influenza virus uncomplicated by secondary bacterial infection.

CASE VII.—The patient was a male infant, aged six months, who was found dead in bed. This child had not received any medical attention before his death, and he was one of three infants who died in similar circumstances in a remote country town in Victoria in the one week.

Post-mortem examination showed that there was reddening of the mucosa of the larynx, trachea and bronchi. The lungs were œdematous and the heart muscle was pale. No other changes of note were observed.

Microscopically, changes similar to those seen in Case VI were observed in the trachea and bronchi. Plasma cells were again prominent in the sub-epithelial tissue and about the mucous and serous secreting glands (Figure VII). There was œdema of the lung parenchyma, and scattered through the œdema fluid were lymphocytes, polymorphonuclear leucocytes and eosinophils. There was also some œdema and hæmorrhage in the interalveolar walls. The heart showed toxic degeneration of the muscle without any accompanying cellular infiltation.

From the trachea and bronchial swabs A/Asian/1957 influenza virus was isolated, and a pure culture of β-hæmolytic *Streptococcus fæcalis* was obtained.

The other two babies who died in the country town in the one week showed, at autopsy, an acute infection of the bronchial tree with some œdema of the lungs. Both of these children also showed marked fatty change in the liver. Although a careful bacteriological and virological investigation was carried out, no micro-organisms were isolated from these two cases.

Asian influenza virus was also isolated from a group made up of older people. They were all coroner's cases requiring investigation because death had occurred suddenly or unexpectedly and the cause was unknown. Their ages were 54, 58, 63, 63, 66 and 69 years; four were males and two were females. Altogether, 28 similar coroner's cases, in which death had occurred suddenly or unexpectedly and in which autopsy showed an intensely reddened tracheal mucosa, were specially examined for influenza virus, but in 22 of them the virus was not isolated. The following case is representative of the six positive cases.

CASE VIII.—The patient was a female, aged 66 years, who was found dead in bed. She had not recently been examined by a doctor. Post-mortem examination revealed an intensely red trachea and larynx. Gross coronary atheroma was found, and an old infarct was present in the wall of the left ventricle. These two features, severe heart disease and intense tracheobronchitis, were common not only to the six cases from which virus was isolated, but also to the remaining 22.

Microscopically, the epithelium of the trachea was stripped off down to the basal cell layer. The *tunica propria* was hyperæmic, œdematous and extensively infiltrated with cells which were mainly lymphocytes, plasma cells and eosinophils. Some macrophages were also present (Figure VIII). The mucous and serous glands showed evidence of damage to the secretory cells in most places, and there was infiltration about the glands with plasma cells.

From the tracheal swab the A/Asian/1957 strain of influenza virus was isolated. The only bacteria isolated from the trachea were green zone streptococci and some colonies of *Hæmophilus influenzæ*.

DISCUSSION.

Previous investigators in this field have mainly focused attention on the changes found in the tracheal and bronchial epithelium. Perhaps the best of these studies is that by Hers (1955), published in a beautifully illustrated monograph from the *Nederlands Instituut voor praeventieve geneeskunde*, Leiden. The histological features emphasized by Hers in human influenza uncomplicated by staphylococcal infection are: (i) superficial focal necrobiosis of the tracheal and bronchial epithelium extending to the basal cell layer, which, however, remains intact; (ii) regeneration of the epithelium from the basal cell layer in four to six days giving rise to an undifferentiated epithelium; (iii) hyperæmia, hæmorrhage and œdema of the *tunica propria* in influenza is considered by Hers to be a consequence of bacterial infection as these changes are also found in non-influenzal bacterial infections of the respiratory tract.

When *S. aureus* is the predominant secondary invader, interstitial extension to the lung perenchyma occurs with hyperæmia, hæmorrhage and œdema, vascular changes with thrombus formation are believed to be due to the production of staphylotoxin.

We have seen these features in our cases. However, we are impressed with certain changes regularly to be found in and about the deeper mucous and serous secreting glands of the trachea and bronchi in our cases. The epithelial cell desquamation and the nuclear changes seen in Case I (Figure I), as well as the desquamated cells dilating the duct shown in Figure II are similar in appearance to the damaged cells and nuclei found in the tracheæ of chick embryos infected by influenza virus (Burnet, 1940). Similar changes are present to a greater or lesser degree in all our material from 1950, 1956 and 1957 cases of influenza. It has been conventional to believe that the influenza virus invades and multiplies in the epithelial cells, and spreads from cell to cell rather like the spread of a grass fire. The histological changes in the glandular tissue leads us to believe that in these fatal cases the virus probably gains access to the deeper tissues and also multiplies in the epithelium of the glands.

The presence of plasma cells about the glands suggests a number of interesting possibilities. It is now generally accepted from the work of Fagraeus (1948) and Coons (1955) that the plasma cell, and more particularly the immature plasma cell, is the main source of antibody production. Twenty years ago Burnet, Keogh and Lush (1937) put forward the view that the antibody to influenza virus might be produced locally in the invaded tissues. Subsequently, the work of others (Oakley and Warrack, 1940) tended to indicate that immunity to influenza in mice was correlated with serum antibody titre. Working with immunized mice, Fazekas de St. Groth and Donnelley (1950) later found that the level of immunity could be correlated with the level of antibody in the bronchial and alveolar washings. The damage to the secretory epithelium of the glands and the accumulation of plasma cells around these damaged glands may be correlated phenomena indicating local antibody formation or mobilization. This deserves further investigation, and some experimental work designed to throw more light on local antibody production is being undertaken.

The increase in the death rate of elderly people from heart disease during epidemics of influenza has been

observed previously (Stuart-Harris *et alii*, 1949 and 1950). The individual who has already suffered severe damage to his heart muscle, e.g. infarction associated with coronary sclerosis, seems to be more vulnerable in an influenza epidemic. The added toxæmia associated with influenza infection causes failure of the already damaged and diseased myocardium, with consequent sudden or unexpected death. There was a marked rise in the number of sudden and unexpected deaths dealt with in the Coroner's Department, Melbourne, during the month of August, 1957. This was also the month of maximum clinical evidence of Asian influenza in Melbourne. The rise in the number of cases of sudden and unexpected deaths in August was due to an increase in the number of deaths of elderly people from coronary arterial disease and myocardial degeneration. The striking fact was that the great majority of them showed macroscopic changes in the tracheo-bronchial tree similar to the changes in those cases in which influenza virus was isolated.

The recovery rate of virus from our post-mortem material is lower than the rate from clinical material. Of our 28 autopsy cases, virus was recovered in six instances (21%). In a series of 44 clinical cases we isolated influenza virus 24 times (55%) from throat washings. Successful isolation of influenza virus from a suspected case depends upon the interval in the course of the infection when the examination is performed. It would be unusual for virus to be still recoverable from the trachea and bronchi of an individual who dies a week or more after the onset of the infection.

In the group of 28 elderly patients, staphylococci were not often isolated. The commonest organism found in our series was the pneumococcus. On the other hand, fatal influenza in young adults is frequently, but not invariably, complicated by staphylococcal infection, e.g. Case V in our series. Here, in addition to the necrosis of the tracheal epithelium there was an intense hæmorrhagic pulmonary œdema with inflammatory cells in the alveolar œdema fluid. Similar changes were described in young adults in the 1918 pandemic (Hers, 1955). Undoubtedly, toxæmia from the associated bacterial infection contributed to the death of these patients. There is more extensive and wide-spread damage to the bronchial epithelium and *tunica propria*, and usually microcolonies of staphylococci can be seen in the desquamated debris in the lumen of the bronchi, and staphylococci can be readily cultivated (often in pure culture) from tracheal and bronchial swabs.

In fatal cases in infants in whom there is influenza, there may be an associated staphylococcal infection, but in our cases of influenza two were probably associated with meningococcal septicæmia, one with the pneumococcus and one with β hæmolytic *S. fæcalis*, and in one case no significant bacteria were obtained from cultures of the tracheal and bronchial swabs.

There is often insufficient change in the lung parenchyma in some of these fatal cases to satisfactorily account for the death of the patient. There may be little or no warning of impending death, which may be truly sudden or unexpected. In attempting to determine the actual cause of death, material has been examined from other organs in the body. Examination of the heart of these patients sometimes shows areas of toxic degeneration. This toxic myocarditis is most often observed as an area of muscle with loss of staining and cell outline, and it resembles the toxic myocarditis of diphtheria. In some cases (Cases I and II), there is cellular infiltration accompanying the muscle lesion, in others (Case VII), infiltrating cells were not present. The presence of these lesions in the heart offers a possible explanation for the suddenness of death, and it may be related to the prostration and tachycardia observed clinically in adults suffering from influenza virus infection.

Summary.

1. The pathology of 13 cases of virologically proven fatal influenza in the epidemics of 1950, 1956 and 1957 in Melbourne is described.

2. Five of these cases occurred in infants, two in young adults, and six in elderly people with varying degrees of coronary arterial heart disease.

3. The histological features observed in these cases include: (i) varying degrees of epithelial degeneration of the tracheo-bronchial tree; (ii) marked hyperæmia of the *tunica propria;* (iii) infiltration of the *tunica propria* and sometimes the epithelium with inflammatory cells, among which plasma cells are often conspicuous; (iv) varying degrees of degeneration of the epithelium of the mucous and serous secreting glands; (v) plasma cells may predominate about these damaged glands; (vi) toxic myocarditis.

4. The relationship of the plasma cell association with the mucous and serous secreting glands of the trachea and bronchi to local antibody production is suggested.

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THE DEMONSTRATION OF THE CARRIER STATE IN CHRISTMAS DISEASE.

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Carriers of Chistmas disease often give a history of a greater tendency to bleed than normal. This is frequently discounted because they are especially conscious of bruising and bleeding since they come from families with a bleeding history for many generations. However, coagulation studies of some carriers of Christmas disease have been abnormal (Reed, 1955).

Five carriers of Christmas disease have been investigated. In each instance there was a long family history of a severe bleeding tendency in the male side of the family. Four of the women had children with Christmas disease, and the other, aged twelve years, was the daughter of a patient and the grand-daughter of one of the carriers. One carrier had an abnormal prothrombin consumption test and has been reported previously (Reed, 1955). The remainder had normal prothrombin consumption tests, but their blood was shown to be deficient in Christmas factor by use of a slight modification of the thromboplastin generation test (Biggs and Douglas, 1953).

Method.

The thromboplastin generation test was performed by the method of Biggs and Douglas (1953), and sera from a selected patient with Christmas disease, normal controls and the Christmas disease carriers were treated in the recommended manner.

The amount of normal serum required to correct the thromboplastin generation test of one millilitre of serum from a selected patient with Christmas disease was estimated by adding increasing amounts of the normal serum until full correction was attained. This amount was then compared with the amount of the serum to be tested which was required to produce full correction of the selected Christmas disease patient's serum. All sera were used at a dilution of 1/10 with normal saline.

This method was used to examine sera from 10 normal individuals (five males and five females), three patients with severe liver disease, the Christmas disease carriers and two true hæmophilia carriers.

Results of Investigation.

A normal thromboplastin generation test resulted when 0·25 millilitre of normal serum was added to 1·0 millilitre of the selected Christmas disease patient's serum in every case, and in some cases only 0·2 millilitre of normal serum was required. A sample of serum was therefore regarded as having a normal level of Christmas factor if 0·25 millilitre corrected the selected Christmas disease patient's serum.

One Christmas disease carrier had an abnormal prothrombin consumption test and has been previously reported (Reed, 1955), and another had an abnormal unmodified thromboplastin generation test. The remaining three had normal routine thromboplastin generation tests, but in each instance more of the subject's serum was required to correct the thromboplastin generation test of the selected Christmas patient's serum than was the case for normal serum. The results of this test used on the serum of one such carrier are shown in Table I.

Sera from the two true hæmophilia carriers were shown to have a normal ability to correct the selected Christmas disease patient's serum.

Three patients with liver disease (alcoholic cirrhosis) were also examined and a reduction in Christmas factor was found in two while the other was normal (Table II).

Discussion.

All the carriers examined had a detectable diminution of Christmas factor in their serum. Should this finding apply to every Christmas disease carrier, it will be possible to remove doubt from the minds of the female members of these families. They can be reassured that their children will be normal, or be forewarned of the possibilities of their bearing children with Christmas disease.

In the past, a number of female patients who have had minor bleeding tendencies have been investigated without success, and it is possible that some of these may have been Christmas disease carriers without family histories.

A similar principle was used in an attempt to detect true hæmophilia carriers but was unrewarding (unpublished observations).

Two of the three patients with liver disease who were studied had severe hepatic involvement with ascites, spider nævi, episodes of hepatic coma, prolonged prothrombin times and autopsy proof of cirrhosis. The level of Christmas factor was found to be normal in one although grossly abnormal in the other. The third patient did not have as marked liver malfunction as the other two, although œsophageal varices were present and a liver biopsy revealed cirrhosis. His prothrombin time was normal but his serum Chistmas factor level was diminished (Table II).

On the basis of these observations it can be suggested that Christmas factor is synthesized in the liver, but its production is unrelated to the synthesis of the factors concerned with a normal prothrombin time, i.e., prothrombin, Factor V and Factor VII.

Summary.

A slight modication of the thromboplastin generation test enabled the detection of a subnormal level of Christmas factor in the serum of five Christmas disease carriers who

[1] Royal Australasian College of Physicians Research Fellow.

[2] Supported in part by the National Health and Medical Research Council of Australia.

Table I.[1]

Results of Thromboplastin Generation Tests.

Tube Number.	N_p+N_s.[2]	N_p+X_s.	$N_p+\begin{cases}N_s\ 0{\cdot}25\text{ millilitre.}\\X_s\ 1{\cdot}0\text{ millilitre.}\end{cases}$	$N_p+\begin{cases}C_s\ 0{\cdot}25\text{ millilitre.}\\X_s\ 1{\cdot}0\text{ millilitre.}\end{cases}$	$N_p+\begin{cases}C_s\ 0{\cdot}4\text{ millilitre.}\\X_s\ 1{\cdot}0\text{ millilitre.}\end{cases}$	N_p+C_s.
1	60 seconds.	60 seconds.	60 seconds.	60 seconds.	70 seconds.	65 seconds.
2	12 seconds.	50 seconds.	40 seconds.	45 seconds.	55 seconds.	50 seconds.
3	13 seconds.	37 seconds.	14 seconds.	24 seconds.	20 seconds.	20 seconds.
4	12 seconds.	25 seconds.	14 seconds.	18 seconds.	16 seconds.	12 seconds.
5	13 seconds.	25 seconds.	12 seconds.	17 seconds.	15 seconds.	12 seconds.
6	12 seconds.	24 seconds.	11 seconds.	14 seconds.	16 seconds.	11 seconds.

[1] Tube number 1 is that in which the mixture containing the serum to be tested is added to normal plasma after incubation at 37° C. for one minute. In the other tubes the mixture has been incubated for two, three, four, five and six minutes respectively before being added to the plasma. Resul ts are expressed in clotting times.

Columns 2 and 7 show normal figures for the thromboplastin generation test. In column 3 serum from a patient with Christmas disease gives greatly increased clotting times. In column 4 the addition of 0·25 millilitre of normal serum restores the clotting time to normal. Columns 5 and 6 show that the addition of neither 0·25 nor 0·4 millilitre of serum from a Christmas disease carrier does this.

[2] "N_p"=normal plasma; "N_s"=normal serum; "C_s"=carrier serum; "X_s"=Christmas patient's serum.

were examined. The demonstration of subnormal levels of Christmas factor in two of three patients with liver disease suggests that Christmas factor is synthesized in the liver. It is unrelated to the synthesis of the factors concerned with a normal prothrombin time.

TABLE II.

Prothrombin Index and Results of Modified Thromboplastic Generation Test in Three Patients with Liver Disease.

Patient.	Prothrombin Index.	Amount of Patient's Serum (Diluted 1/10) Required to Correct Standard Christmas Serum (Diluted 1/10).
1. A[1]	60%	—
2. B	80%	0·25 millilitre.
3. C	100%	More than 0·25 millilitre.
4. Control ..	100%	0·25 millilitre.

[1] Routine thromboplastin generation test showed that this patient had a lowered Christmas factor level and additions of his serum to the standard Christmas disease serum did not produce any correction of the thromboplastin generation test.

Acknowledgements.

I wish to thank Professor C. R. B. Blackburn for his advice and encouragement in the preparation of this paper.

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PRURITUS ANI: A PROSAIC PROBLEM.[1]

By Edward Wilson,
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To most people, "to scratch or not to scratch" is a question which resolves itself into how to scratch unseen. The urge (or itch) to scratch an itch may become overpowering, and it is interesting to speculate which celebrities, whose every move is news and who are continually in the public eye, suffer from *pruritus ani*. They must surely be strong-willed not to surrender immediately to this urge. Ordinary mortals can quickly seek seclusion and then, to quote Gray, they can "scratch a fearful joy".

Pruritus ani is a prevalent complaint in man, but other animals are also affected. Nowadays one wonders how the problem of *pruritus ani* would be dealt with by a man encased in a space suit, and also whether the dog confined to Sputnik II was in a position to scratch.

Instead of pursuing such flights of fancy, this paper deals with the more prosaic clinical problems of *pruritus ani*.

Pruritus ani is frequently the only symptom, and oftimes it occurs in the absence of any physical sign. It is more common in men than in women, in the elderly than in the young, in summer than in winter, and in neurotics than in psychotics. It may be acute or chronic, and it waxes and wanes. The response to treatment varies considerably.

Pruritus ani may lack importance to the non-afflicted, but in truth it is not a triviality, nor is it amusing except to some onlookers. The only pleasure it brings to the patient is that provided by proper treatment or by scratching. It is funny only in the sense of being peculiar and ticklish in the sense of being a problem which requires careful handling.

Pruritus ani is of interest to dermatologists, psychiatrists, allergists, proctologists, etc., but their various points of view differ widely. For example, Wiess and English (1957) state that in their "experience, all female patients [suffering from *pruritus ani*] *were frigid*", a statement that ignores the fact that it is possible to produce *pruritus ani* in all women by certain physical and chemical agents. Surely it is not implied by their statement that all women are frigid! Other statements to the effect that *pruritus ani* is always an indication of latent or overt homosexual tendencies would also seem to non-psychiatrists to be exaggerated. However, it will be conceded that in some cases *pruritus ani* may be a reaction to stress, while in others it may be indicative of something amiss in the patient's sexual relationships, whether perverted sexual desire or a lack of gratification. In my experience such cases are rare, and it is only after excluding all obvious causes and after obtaining no response to various empirical measures that a patient is turned over to the ministrations of the psychiatrists.

The anus and perianal region constitute a zone of hyperæsthesia, and the greater frequency of pruritus in this area compared with other parts of the body is not altogether surprising. As Portes (1951) pointed out, this hyperexcitability is further increased by repeated irritation which augments the vicious circle of itch-scratch-dermatitis-scratch.

Pruritus ani is associated with atrophic perianal skin especially in the elderly, or with skin which becomes thickened with accentuated folds, diminished elasticity and dullness of the surface. Frequently there is loss of pigmentation of the perianal ridges, whereas the crevices may be either pale or reddened. These appearances are quite characteristic.

The histological changes in the perianal skin in *pruritus ani* include (i) dilatation of the blood vessels and lymphatics, especially in the papillæ, (ii) œdema, (iii) thickening of the granular layer, (iv) thickening of the horny layer, and (v) perivascular lymphocytic infiltration.

Ætiology.

A perusal of many books, such as Molesworth's (1937), reveals that *pruritus ani* is grouped as a disease of unknown or doubtful origin; and certainly the ætiology remains obscure in the majority of cases. In others, however, the cause or causes are eventually discovered.

Generalized pruritus, of which *pruritus ani* is but a small part, has many causes, as follows: (i) Metabolic disorders—(*a*) jaundice, (*b*) *diabetes mellitus*, (*c*) gout, (*d*) thyrotoxicosis, (*e*) renal insufficiency; (ii) blood dyscrasias—(*a*) leukæmias, (*b*) Hodgkin's disease; (iii) parasites—(*a*) scabies, (*b*) pediculi; (iv) generalized skin disorders—(*a*) eczema, (*b*) urticaria, (*c*) lichen planus; (v) pregnancy; (vi) drugs—(*a*) opiates, (*b*) cocaine; (vii) senility; (viii) dryness of the skin due to excessive washing; (ix) heat and sweating; (x) lack of cleanliness.

Pruritus ani may be, and often is, associated with *pruritus vulvæ*. There is then usually an irritant vaginal discharge, and this should be investigated. In a like manner irritant vaginal douches and highly acid urine may cause *pruritus vulvæ et ani*.

The local causes of *pruritus ani* consist of the following: (i) perianal skin lesions—(*a*) psoriasis, (*b*) seborrhœic dermatitis, (*c*) leukoplakia; (ii) application of irritants to the perianal skin—(*a*) local anæsthetic agents, (*b*) kerosene, turpentine and many other chemical agents, (*c*) newsprint, (*d*) X rays; (iii) lack of cleanliness—(*a*) laziness, (*b*) psychosis and mental insufficiency, (*c*) diarrhœa; (iv) excessive washing; (v) leakage of mucus through the anus—(*a*) patulous anus due to senility, previous maladroit surgery, injury, or nerve lesion, (*b*) excess production of mucus due to pregnancy, hæmorrhoids, polypi, inflamed anal papillæ and crypts, adenomata, villous tumours, carcinomata or other lesions of the anal canal or rectum; (vi) leakage of liquid paraffin through the anus; (vii) leakage of the cacao butter base of suppositories through the anus; (viii) leakage of pus through the anus—(*a*) carcinoma of the rectum, (*b*) chronic ulcerative colitis, (*c*) granular proctitis, (*d*) dysentery, (*e*) pelvic abscess, (*f*) anal fistula; (ix) perianal discharge—(*a*) anal fistula, (*b*) healing perianal surgical wounds, (*c*) condylomata; (x) infections (*a*) threadworms, (*b*) fungus infections; (xi) administration of certain broad-spectrum antibiotics—(*a*) "Aureomycin", (*b*) "Terramycin", (*c*) "Chloro-

[1] Read at a meeting of the New South Wales Branch of the British Medical Association on December 12, 1957.

mycetin"; (xii) persistent scratching, conscious or unconscious.

Over the years difficulty has been experienced with a few malingerers who complained of *pruritus ani*, but each one ceased attending hospital immediately their attendance times were inserted on the medical certificate for their employers.

Other more nebulous factors which, at various times and by various authors, have been accused of causing *pruritus ani* are as follows: (i) allergies to certain food stuffs and especially shell fish, to fungi, bacteria, dyes and even to various drugs and laxatives used over long periods; (ii) emotional and nervous stresses; (iii) deficiencies of vitamins; (iv) deficiencies of hormones; (v) lack of ultra-violet light on the perianal skin (because of its secluded situation); (vi) excess alcohol, tobacco or highly seasoned foods—a triad which never escapes blame when the ætiology of a condition is obscure.

With such diverse causes, it is, of course, not surprising that there is no panacea.

When one is dealing with many cases of *pruritus ani* it is soon realized that it is not prudent to generalize about its ætiology. In this regard Frankfeldt (1948) has pointed out that not every sufferer from moistness of the anus develops *pruritus ani*, nor does every sufferer from allergic dermatitis, a patulous anus, interdigital fungus infection, leukoplakia or *diabetes mellitus*. Incidentally, glycosuria accompanied by urinary incontinence may be a cause of *pruritus ani*, but the *diabetes mellitus* is more closely related to the elevated blood sugar level than to the glycosuria.

Treatment.

The majority of patients with *pruritus ani* are self-treated at first, or the local application is chosen on the advice of a neighbour or so-called friend and, oddly enough, strong irritants, such as kerosene, may even be repeatedly applied. Not infrequently the condition is thereby prolonged, but the ensuring pain does, at least, direct attention away from the pruritus.

Ungar and Damgaard (1955) have shown that pruritus is produced by free proteinases in the skin and the subsequent stimulation of nerve endings; thus, the treatment of *pruritus ani* is concerned with control of the factors which lead to liberation of these enzymes.

Most lesions of the anus—for example, anal fistula—can be approached in the certainty that their permanent cure is possible without any great difficulty. *Pruritus ani*, on the other hand, presents a special problem, for a permanently successful result depends on prophylactic measures which the patient himself must employ. However, no patient with *pruritus ani* who will cooperate is incurable.

There are many medical practitioners who greet the sufferers from *pruritus ani* with a mental sigh of despair and consider themselves fortunate to see but a few with this unglamorous condition; yet it is only by persistent interest in them that satisfactory results are possible.

It is significant, perhaps, that herbalists are prepared to treat a wide variety of diseases, from impetigo to impotence, but their optimism does not always encompass the treatment of *pruritus ani*.

If the cause of *pruritus ani* can be determined, its treatment will be clear; but in many cases the cause remains undetermined, and treatment must be empirical.

Many years ago Whitfield wrote that "an itching anus is nearly always a damp anus". This is just as true today, and the treatment in the common cases with no apparent cause is still based on keeping the anus and perianal skin dry and avoiding scratching. Similarly, itchiness around a colostomy is relieved by keeping the abdominal skin clean and dry.

Pruritus ani may be perpetuated by damage to the tissues due to scratching and by exudation from the surface of the scratches. Persistent scratching will often induce some lichenification in the skin, which will maintain or even increase the itching; and, as Lockhart-Mummery (1923) has pessimistically suggested, the changes in the skin may be associated with permanent changes in the nerve endings.

If the patient does not scratch, there is no doubt that the condition will respond more quickly to treatment. However, it is difficult to prevent all scratching; the patient will scratch his head when he is thinking and the pruritic region when he is not thinking. Even so, it is grossly unfair and unkind simply to state that if he did not scratch the condition would resolve. True as that may be, it is not always humanly possible to subjugate this impulse, and most patients require greater assistance than this piece of advice, gratuitous or otherwise.

When one is presented with a patient suffering from *pruritus ani*, a careful general and local examination is carried out, and unless the condition is quickly relieved by keeping the anus and perianal region clean and dry, the fæces, the urine and the scrapings from the perianal skin will be examined. Special tests, such as an attempt to cultivate the scrapings on Sabouraud's agar, will only occasionally be required.

It has jestingly been stated that patients suffering from influenza can be recognized in the street by their surreptitious scratching of the *pruritus ani* induced by an antibiotic. There is some truth in this, for the use of certain wide-spectrum antibiotics is frequently complicated by *pruritus ani*, and this complaint is often slow to subside after administration of the offending antibiotic has been stopped. Whether this *pruritus ani* is due to a change in the flora of the intestine and of the perianal skin, to avitaminosis, or to leakage of irritant material from the bowel is undecided, but there is no doubt of its relationship to the exhibition of certain antibiotics. However, when *pruritus ani* does develop, the antibiotics should be stopped, and if relief is not soon obtained, a 1% gentian violet solution should be applied to the perianal region in the hope of eradicating the yeasts. Because of this proclivity to produce *pruritus ani*, if for no other reason, the empirical or prophylactic use of the antibiotics should be eschewed.

Large doses of liquid paraffin frequently cause *pruritus ani* because of leakage through the anus. When a regular laxative is required, a hygroscopic preparation, such as "Normocol", which does not leak from the anus, is to be preferred.

The repeated application to the perianal skin and anus of any ointment is usually followed by local changes, no matter whether it has a greasy or water-soluble base. Accordingly, all such preparations are avoided except for short periods. This restriction applies with added force, of course, to those ointments containing local anæsthetic agents which, even by themselves, are irritating to the skin.

The ointment with the most established place in the treatment of *pruritus ani* is hydrocortisone ointment; and, surprisingly, the different concentrations from 1% to 5% appear to be equally effective. The rapid relief provided by these ointments is sometimes gratifying, even in tormenting cases, but it is not sustained. In others it does not even provide temporary relief.

In my experience the only antibiotic ointment that has been of any appreciable value in *pruritus ani* is neomycin ointment. This has been occasionally used for the treatment of resistant bacterial infections of the skin secondary to the scratching, but even then its effect has been only evanescent.

Instead of ointments, the mainstays of antimycotic applications to the perianal region are Castellani's carbol-fuchsin paint and aqueous and alcoholic solutions of gentian violet. These dyes are applied with a brush, but for not more than 10 or 12 days lest chemical dermatitis be produced. They have the advantage that any scratching, scraping, or scrubbing—conscious or otherwise—results in tell-tale staining of the fingers, etc. Whitfield's ointment (50%, with or without 0·5% to 1% thymol) is brought into use only after these dyes have failed to give relief.

If there is an abrupt transition from the affected to the normal skin, antimycotic measures should be instituted, even though a search for more definite evidence of a fungus infection is not successful (Gabriel, 1950).

The chief indication for Grenz or X-ray therapy in *pruritus ani* is excessive perspiration (Swinton, 1947); but

even then it should not be repeated, owing to the possibility of producing irradiation dermatitis with the skin thin, dry, itchy and easily damaged by scratching. Instead of irradiation, sweating may be reduced by the application of some lotion such as a 5% aqueous solution of aluminium acetate. The proprietary preparations used for controlling under-arm perspiration are too strong for use on the perianal skin.

If, finally, after a thorough consideration of all possible causes, no explanation is found for the *pruritus ani* except dampness and the resulting "pruritic" changes in the perianal skin, the following treatment is advised. The perianal skin is kept clean and dry and scratching is avoided. After defæcation the area is washed with cotton-wool, the soap is completely removed from the skin, and after the area has been dried with more cotton-wool—not with a rough towel—a powder is applied with more cotton-wool or a powder puff. This powder consists of equal parts of zinc oxide, starch and boracic acid. If there is a history of a fungus infection, 1% salicylic acid is added to the powder for a few days. Underclothes and pyjamas are loose, made of open weave cotton, and their sleeves and legs are short. Nylon is definitely contraindicated, and at no time is an excess of clothes or bedclothes used. If the complaint is worse in bed, the perianal area is washed with cold water and dried immediately prior to retiring. The loose, baggy trousers that are the fashion in some eastern countries allow the circulation of air around the perineum and must surely have been adopted for this reason. If drying and dusting alone are not sufficient to relieve the itching, a calamine lotion with phenol (1% to 2%), menthol (0·5% to 1%), *Liquor Carbonis Detergens* (2% to 5%) or *Liquor Picis Carbonis* (2% to 5%) is applied several times a day. A well-proven prescription for calamine lotion is that of St. Mark's Hospital, London, which is as follows: phenol 15 grains, zinc oxide 30 grains, calamine 15 grains, glycerin 30 minims, alcohol (90%) 30 minims, cream of magnesia to one ounce. A simpler lotion is phenol 10 minims, kaolin 40 to 60 minims, milk of magnesia to one ounce. Potassium permanganate baths are tried if these measures fail. Any highly flavoured article in the diet is deleted, and if the patient has been consuming large quantities of protein a vegetarian diet is adopted. Similarly, if the patient is a vegetarian it is often worthwhile changing to a more common diet. In most cases some benefit follows a change to a good superfatted soap. If the skin is very dry and atrophic, lanoline alone is applied for a few days.

Notwithstanding the probability that many cases of *pruritus ani* have an allergic basis, the direct effect of the antihistaminic drugs in *pruritus ani* has been disappointing. On the other hand, their sedative action may often be employed with advantage, and if there is undue restlessness at night, pyribenzamine ("Benadryl") is very useful, for it is not associated with depression or other sequelæ. The patient with well-established *pruritus ani* will usually be depressed enough without adding the post-sedative depression of a drug such as pentobarbitone.

If the condition is still not relieved and no cause has been found, various lines of treatment should be followed *seriatim*. (i) A course of gentian violet or of "Antepar" (piperazine citrate—Nesselrod, 1957) together with other measures to eliminate any threadworms should be tried. (ii) Castellani's carbol-fuchsin paint or 50% Whitfield's ointment should be applied locally. (iii) Silver nitrate (0·5% to 5%) in *Spiritus Ætheris Nitrosi* should be tried for a few applications. (iv) Regular doses of an antihistaminic such as "Diatrin" may be given. (v) Hormones may be administered particularly 0·5 to 1·0 milligrammes of stilbœstrol per day to elderly women. (vi) Vitamins may be administered. (vii) Regular doses of a mild sedative (not a barbiturate) or of a tranquillizer such as "Pacatal" or chlorpromazine may be tried.

If all these measures still fail, all local applications are ceased even though the appearances of the perianal skin and of the anus do not suggest a chemical dermatitis.

Several authors have advocated repeated shaving of the perianal area in patients with *pruritus ani*; but, in my experience, the results have not justified the trouble involved.

All patients with *pruritus ani* will improve if put to bed, but this is rarely necessary.

My worst case of *pruritus ani* was that of an obese, unattractive woman who, despite a worsening of the condition, would not obey instructions. She was not in the habit of taking orders, and she was not easily persuaded to change this habit until the pruritus required relief beyond all else. The buttocks were strapped apart, as suggested by Hughes (1957), and she had two weeks' rest in bed in hospital. Exposure of the perianal region and anus to sunlight for many hours a day resulted in a return from the greyish-white, sodden perianal skin to a normal appearance and, as had been promised her, relief from the pruritus. Incidentally, the window through which the sunlight entered was on the second floor and was not overlooked. Her upbringing rebelled against wasting money, and thus on leaving hospital she was more amenable to accepting instructions about keeping the perianal area dry, reducing weight and avoiding gormandizing. For years now she has not mentioned any recurrence, and it is certain that, with almost the first scratch, she would have been on the telephone again to let me know.

Surgical Measures.

Most patients with severe *pruritus ani* would probably agree to operation if it was suggested to them; but, with the exception of those operations directed at concomitant lesions of the anus and anal canal, operative treatment of *pruritus ani* has been superseded by medical measures. However, a variety of operations, such as those of Ball and Hertzler, are still described in books on operative surgery.

Occasionally in cases of *pruritus ani*, it is only after excision of the many skin folds that the perianal region can be kept dry. These folds are the result rather than the cause of the *pruritus ani*, and unless other measures are taken, they will soon reform after the wound is healed. The same applies to excision of the skin folds and grafting. In other cases, eradication of even a gross anal or rectal lesion can be unrewarding as far as any effect on the *pruritus ani* is concerned.

The neurectomies and the various procedures of undercutting the skin were so often followed by a recurrence of the pruritus by the time the patient had recovered from the operative trauma that they have not earned a place in the management of this complaint. In addition to their failure to give more than short-term relief from the pruritus, these measures were sometimes followed by various degrees of infection or even by permanent incontinence of fæces.

Injection Treatment.

The injection treatment of *pruritus ani* enjoyed some popularity in the past two decades. Sterile alcohol, distilled water, hydrochloric acid and long-acting anæsthetic agents were all used in turn; but, as the final results were inconstant, these injections have fallen into disfavour. Sloughing of the skin and superadded infection were frequent accompaniments of such treatment.

Summary.

Pruritus ani is but a symptom and not a disease *per se*. As such it is discussed with special reference to its ætiology and treatment; and the management of cases with no discoverable cause is considered in detail.

The basis for this paper is a personal experience with many hundreds of patients, who have been pursued with advice and treatment. As a result of following this advice and treatment they now have not an itch between them.

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ILLUSTRATIONS TO THE ARTICLE BY K. M. BOWDEN AND E. L. FRENCH.

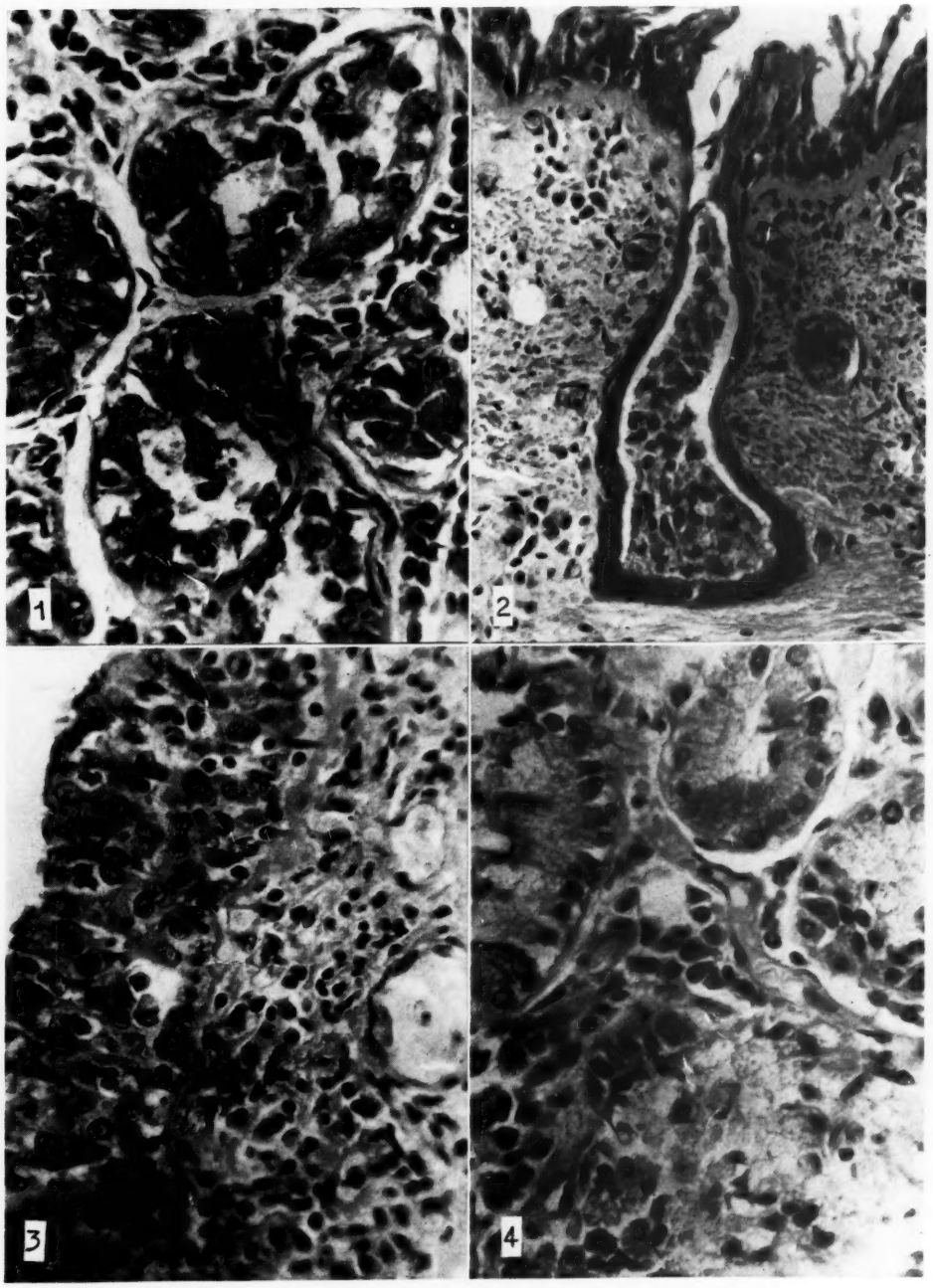

FIGURE I.—Case I: Tracheal mucous glands showing degeneration and desquamation of the secreting cells and infiltration with plasma cells. (Hæmatoxylin and eosin stain, × 500.) FIGURE II.—Case I: Duct of mucous gland dilated with degenerated and desquamated cells. (Hæmatoxylin and eosin stain, × 290.) FIGURE III.—Case III: Tracheal epithelium showing swelling and nuclear damage with invasion by inflammatory cells. (Hæmatoxylin and eosin stain, × 470.) FIGURE IV.—Case III: Tracheal glands showing damaged secretory epithelium and plasma cell nests about the lobes. (Hæmatoxylin and eosin stain, × 470.)

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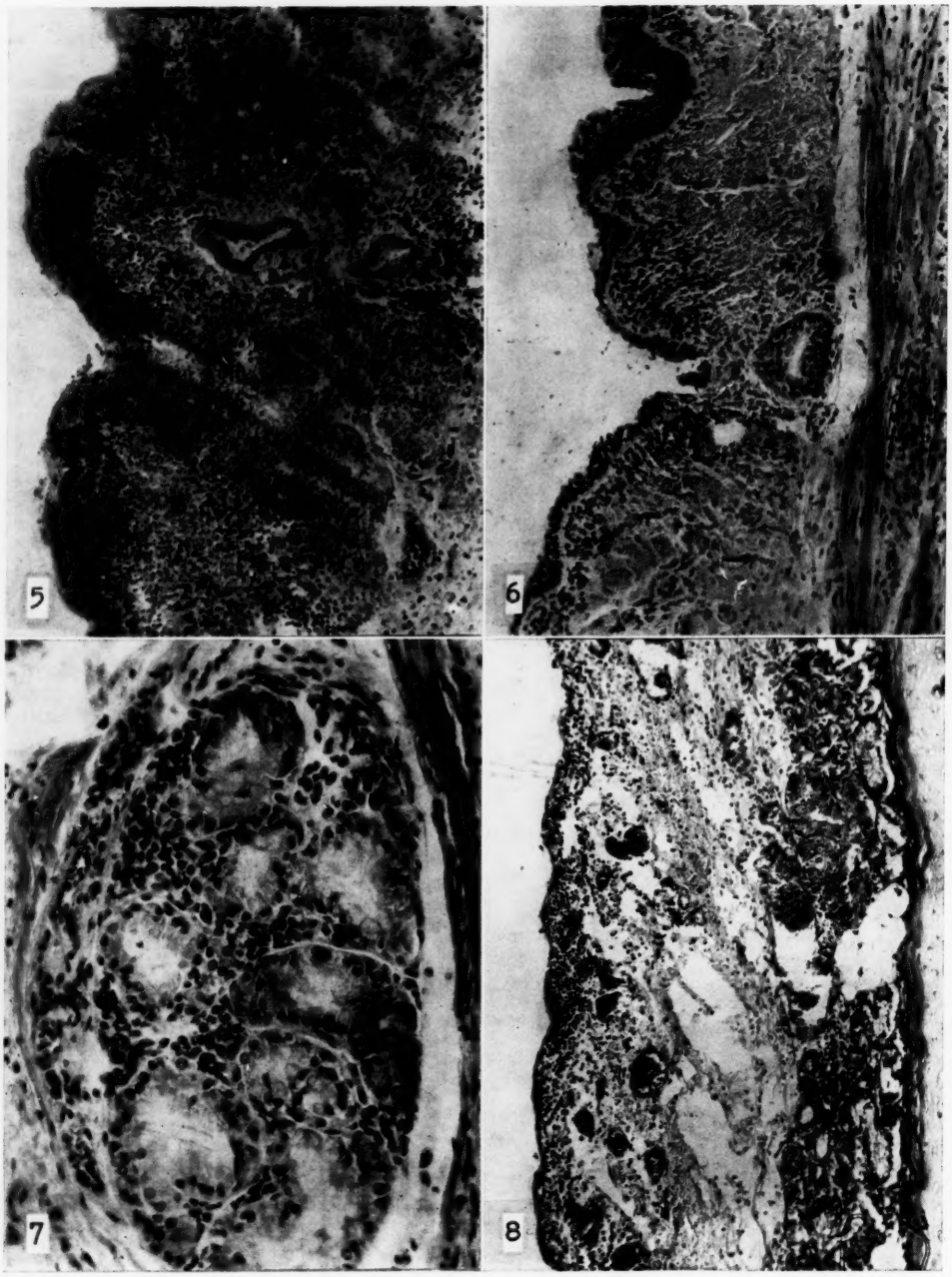

FIGURE V.—Case V: Section of trachea showing coagulation necrosis of the epithelial layers with intense inflammatory reaction extending deep in the *tunica propria*. (Hæmatoxylin and eosin stain, × 140.) FIGURE VI.—Case VI: Section of bronchus showing varying degree of epithelial damage with inflammatory reaction in the *tunica propria*. (Hæmatoxylin and eosin stain, × 140.) FIGURE VII.—Case VII: Tracheal glands heavily infiltrated with plasma cells. (Hæmatoxylin and eosin stain, × 230.) FIGURE VIII.—Case VIII: Section of trachea showing stripping of the epithelium, intense hyperæmia and infiltration of the *tunica propria* with lymphocytes, plasma cells and some eosinophils. (Hæmatoxylin and eosin stain, × 470.)

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INDICATIONS FOR REMOVAL OF TONSILS AND ADENOIDS.[1]

By I. LOPERT,
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THE operation for the removal of tonsils and adenoids has been practised since ancient days, but, in spite of this fact, there has always been controversy about the indications for their removal. Lately, as you all probably know, this controversy has reached, as you might say, its highest point. You have all, no doubt, read the article by Fry (1957) on this subject, and all the subsequent discussion and correspondence it evoked. You have also, no doubt, drawn your own conclusions about the subject.

In the light of all this, I have tried to give a short survey of the indications and contraindications to this operation, basing it mainly on the British school, as represented by St. Clair Thomson and Negus, and partly on the American school, as represented by Chevalier Jackson of the famous Philadelphia Clinic.

One cannot be quite dogmatic in enumerating the indications; some elasticity must be given in veiw of the presence of other factors, except purely medical ones — namely, living conditions, schooling and so on. The indications, which will be set out in numerical order, will apply mainly to school-children between the ages of five and nine years. In adults, as you know, the tonsils have no function, and, in consequence, the indications for their removal are more straightforward and fewer. While I am on the subject of adults, I should like to point out that there is no strict age limit for the operation, provided the patient is fit for anæsthesia and the indication is there, and I myself have performed it on a few occasions on patients of 55 and even 65 years of age. The indications for operation are as follows: (i) grossly enlarged and infected tonsils which, in association with adenoids, cause interference with respiration night or day, or cause alteration of the voice and interference with articulation; (ii) frequent sore throats, attacks of tonsillitis and peritonsillar abscess; (iii) persistently enlarged cervical glands; (iv) recurrent Eustachian catarrh, or suppuration of the middle ear; (v) chronic infection, and the diphtheria carrier state; (vi) secondary effects due to absorption through chronically infected tonsils, with intermittent rises in temperature, or a chronic condition of ill-health retarding the child; in short, tonsils as a source of focal infection, in both children and adults. From experience, you will have noticed that a few of the indications may be present in the same patient.

Before we discuss each indication separately, I should like to give a short survey of Waldeyer's ring of lymph-adenoid tissues, which are conveniently situated at the crossroads of the respiratory and alimentary tracts—namely, in the naso-pharynx and oro-pharynx, and which play a very important role in the defence of the organism in the first years of life.

In a diagrammatic arrangement of Waldeyer's ring (Figure I), it can be seen that the palatine tonsil is its most important member. It is connected to a secondary ring, formed by the various cervical glands, which forms a second line of defence. These glands drain Waldeyer's ring, and become enlarged when the first ring becomes grossly infected. Of this second line of defence, I should like to mention two groups of glands. The first comprises the jugulo-digastric or tonsillar glands, situated below the angle of the jaw, in the angle formed by the posterior belly of the digastric muscle and the jugular vein. This gland directly drains the tonsil, and when infection of the tonsils is present, it becomes enlarged and often tender, and is therefore of clinical importance in the diagnosis. The second group consists of a few glands lying behind the oro-pharynx on each side of the mid-line; they sometimes become enlarged and even suppurate and form a retro-pharyngeal abscess, a serious complication in cases of acute tonsillitis in young children. As the tonsil is the most important member of Waldeyer's ring, this paper would be far from complete without a short survey of its function.

We know, from histological studies, that, apart from having a layer of mucous membrane on its oral or medial surface, which also shows the presence of crypts, the tonsil has a very similar structure to that of a lymph gland. The other anatomical difference is that, whereas a lymph gland has both afferent and efferent vessels, the palatine tonsil has only efferent vessels, which drain into the jugulo-digastric lymph glands of the second ring of defence. However, in spite of that, its function is not as clearly defined as that of the lymph glands, which form an important part of the reticulo-endothelial system.

There are many theories as to their function, and the subject is not settled yet. Amongst the theories advanced are the following: (i) They act as blood-forming glands; (ii) they contain germinative centres, the purpose of which is to destroy old lymphocytes and supply young ones into the blood; (iii) they remove and destroy dead leucocytes and bacteria, and fight live organisms, as do other members of the reticulo-endothelial system; (iv) they secrete a mucus which facilitates deglutition by lubricating the bolus of food; and (v) they even manufacture an internal secretion which retards bodily growth.

But in spite of the many theories, a fact that in itself speaks for our lack of definite knowledge, it is reasonable to regard the various tonsils of Waldeyer's ring as organs for the defence of the respiratory and alimentary tracts during the early years of life. The ages in which they are most prominent, their situation, their structure, their frequent enlargement in infection, their lasting hypertrophy after repeated infections and their normal involution at puberty, appear to confirm this view.

First Indication.

Enlargement of the tonsils is often given as a reason for operation, as well as being held to be evidence of chronic infection. With the risk of repeating myself, it must be stated here again that very often the enlargement is not more than a natural and physiological hypertrophy, or rather hyperplasia, which is common to all lymphatic structures in children in the early years of life, and particularly between the ages of three and eight years. The hyperplasia normally tends to disappear at about the age of 12 years.

The lymph tissues in the naso-pharynx and the oro-pharynx are particularly prone to this hyperplasia, as they are situated at the crossroads of the respiratory and alimentary tracts, and they bear the brunt of attack by various organisms from an early age.

It is quite obvious what harm can be done to the child by the unnecessary removal of these structures. I will refer to this in more detail when I come to the discussion of frequent colds and allergy in a child.

Size of the tonsils as an indication for operation, therefore, can be considered only when the enlargement is combined with evidence of infection, and when, in association with adenoids, it causes marked interference with respiration by night or by day, or is causing marked alterations of voice and interference with articulation and taking of food. It is surprising how rarely this state is present, and how small a chink in the airways is sufficient to allow breathing.

Enlargement of the tonsils, again, as clinical evidence of infection, is very indefinite and vague. Unless there is obvious presence of pus, with other general symptoms and

[1] Read at a meeting of the Ballarat and District Base Hospital Clinical Society, Ballarat, May 29, 1957.

findings which are now considered to be evidence of chronic infection (and which I will discuss later), the only certain way of proving it is by histological examination, when the tonsils have undergone hypertrophic degeneration and become useless and harmful.

Second Indication.

In adults, attacks of acute tonsillitis are fairly common and are easily diagnosed, peritonsillar abscesses occur and, of course, these patients should have their tonsils removed. In children the problem is not so simple.

True acute tonsillitis, and more so peritonsillar abscess, is very rare in children under five years of age. It becomes slightly more common between the ages of five and 10 years. Instead of peritonsillar abscess, the dangerous complication in young children from acute tonsillitis is

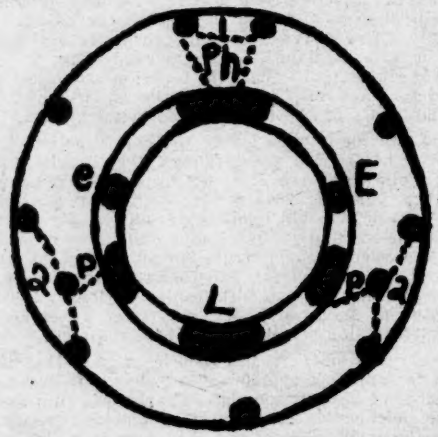

Figure I.

Diagrammatic arrangement of Waldeyer's ring of lymphadenoid tissues. PP, palatine tonsils; Ph, pharyngeal tonsil or adenoids; Ee, Eustachian or tubal tonsils; L, lingual tonsil; 1, retropharyngeal glands; 2, jugulo-digastric or tonsillar glands.

acute retropharyngeal abscess. The difficulty in making a correct diagnosis and deciding on operation in children, lies in obtaining a correct history, as well as correlating the various clinical findings. Very often the mother will say that the child suffers from sore throats; when asked to elaborate carefully, she will state that the child gets a cold frequently, coughs and then develops a sore throat, which parents will often call tonsillitis.

These cases are mainly "non-specific", and are due mostly to an upper respiratory infection by an unidentified virus, and it is these children who will probably "grow out of" these attacks after the age of six or seven years. In many of these cases, of course, the sore throats, as well as the cough, are caused by irritation of the throat as a result of post-nasal discharge from infected sinuses.

From statistics in various clinics and hospitals, it has been shown that in only just over a third of the cases could it be proved that true tonsillitis was caused by a hæmolytic streptococcus or by Vincent's organisms, or that the condition was glandular fever. I should, therefore, like to stress here that the diagnosis of recurrent attacks of tonsillitis in children should be made with great caution.

As I have just mentioned, frequent colds and upper respiratory infections that lead to sore throats are often used as indications for operation. Actually, we are dealing here with the so-called catarrhal child. There is no specific syndrome or picture, but the parents will state that the child gets frequent colds, suffers from nasal catarrh, has a troublesome cough particularly at night, often sneezes a lot, and suffers an occasional earache.

All these conditions are often described as infections, and the tonsils are often blamed for them; but in most cases they are due to many other factors, especially allergy, climatic changes, dietetic errors and unhygienic living conditions. In a small proportion of cases, true infection of the sinuses can be shown to be present, and in many cases it is responsible for the cough at night, as a result of the post-nasal discharge irritating the throat, or even being inhaled. It is also this post-nasal discharge that infects the adenoids and causes the sore throat, which the parents will call tonsillitis.

In these cases, often all that is necessary is sinus washout and removal of the adenoids only, followed, perhaps by short-wave diathermy and by breathing exercises. It must be remembered that the maxillary antra are present at birth, and most of the other sinuses are developed by the age of five or seven years, and may contain a fair amount of pus.

Nasal allergy can often be diagnosed in these children, from a carefully obtained history and from the appearance of the nasal mucosa and turbinates, as well as from the presence, in most cases, of a clear family history of allergy. Therefore, removal of the tonsils in the catarrhal child will deprive him of the main defence and turn him into an invalid, making him an easy victim of repeated respiratory infections with serious end-results. In most of these cases, often all that is necessary is to try to give the child a clear nasal airway and to persist in conservative treatment. It is often enough in these children only to remove the adenoids in order to improve their breathing. It should be kept in mind that these are the children who will grow out of their frequent colds with the accompanying sore throats, most probably at the age of eight to 10 years, as by then it is assumed they will have acquired an immunity to infection, and possibly as well to the other agents that may cause the allergy.

It is in this group of cases that the medical practitioner must most strongly resist the insistence of parents that something must be done, for although by operating he may relieve the anxiety of the parents, particularly an anxious mother, irrevocable damage will be done to the child.

Third Indication.

We are concerned here mainly with two forms of chronic lymphadenitis of the neck.

Chronic Non-Specific Lymphadenitis.

This is a relatively uncommon condition, for the reaction of lymph glands to infection is so rapid and vigorous that any inflammation short of suppuration subsides as soon as the primary focus of infection is overcome. This can be observed after a first or sometimes even a second attack of acute tonsillitis in children. However, the glands may remain enlarged if the attacks are repeated frequently, and the infection remains latent in the tonsils. Consequently, chronic non-specific lymphadenitis of the neck is almost invariably due to the persistence of the primary focus of infection. However, it must be appreciated that, apart from the tonsils, chronic foci occur commonly in the gums, the teeth and the skin of the face and neck, as well as in the scalp. These last-mentioned sources of foci of infection must be excluded when a decision regarding tonsillectomy is being made in cases of enlarged cervical glands.

Tuberculosis of Glands in the Neck.

Tubercle bacilli usually gain entrance to the body in the pharynx, the lungs or the small intestine, and consequently the glands first affected are generally those of the neck, mediastinum or mesentery. In tuberculosis of the neck glands, two distinct types of infection may be recognized.

In the first type, the adenitis is a manifestation of widespread tuberculosis, and signs of active disease are often present in the lungs. The glands are not greatly enlarged, are multiple and soft in consistency, and very rarely undergo caseation. They are mostly situated in the lower parts of the neck, and the child looks pale and, in general, ill.

The second type, which concerns us mostly, is more often seen in surgical practice, and is due to a purely local infection. The child is often of healthy appearance, and there is no evidence of any other tuberculous lesions. Generally, one gland is grossly enlarged and diseased, whilst a few adjacent glands are involved to a smaller extent. In most cases the principally affected gland is the tonsillar or jugulo-digastric gland, less often a gland in the submaxillary region.

It is thought that in this local type of disease the infection gains access to the gland directly from the pharynx, and in the majority of cases the site of entry is at the tonsil. The bacillus is often of the bovine type, and in many cases, no doubt, is milk-borne. Often there is a predisposing factor lowering the local defence mechanism, in the form of a recent attack of acute tonsillitis, or one of the infectious fevers, particularly measles or scarlet fever.

In this local type of disease, the gland principally involved may progress to caseation and to the formation of a cold abscess. This stage is rarely reached and is rarely seen in practice, as there is ample time to remove the tonsils, with complete recovery of the patient and recession of the disease in the glands; for tuberculosis of lymph glands, fortunately, usually pursues a very chronic course, and often remains limited during a very long period to a single gland or group of glands.

Fourth Indication.

Recurrent attacks of earache, without any discharge and with very slight changes in the drum, are often used as an indication for operation. Recurrent earache is very common in children between the ages of two and eight years. Apart from the fact that it may be referred from another region, mostly from the teeth, it is most commonly due to the presence of a naso-pharyngeal infection. The presence of adenoids is also responsible for the intermittent deafness that frequently accompanies the earache, and if it incapacitates the child, or if he is losing much schooling, removal of adenoids only is often sufficient to relieve the symptoms.

Acute Otitis Media.

Acute otitis media deserves more consideration as an indication for removal of tonsils and adenoids. When the attacks recur at frequent intervals, and are accompanied by high temperature, pain and intermittent blood-stained discharge, and, in general, cause ill-health, apart from keeping the child away from school, it is most desirable to remove the tonsils and adenoids to eliminate any source of infection from the oro-pharynx and naso-pharynx, also to ascertain the state of the sinuses, and so create ideal conditions for the ear or ears to heal. However, I should like to add that during the past two decades there has been a decline in both the incidence and the severity of *otitis media*. This can be attributed mainly to two factors: first, improved hygiene and living conditions, and secondly, the introduction of sulphonamides and antibiotics.

For these reasons, therefore, the decision for removal of tonsils and adenoids must not be made very hastily, and more thought should be given to it.

Eustachian Catarrh or Catarrhal Otitis Media.

This is characterized by intermittent mucoid or muco-purulent aural discharge, coming on mostly after a cold. There is very little pain or intermittent deafness with it, the hearing, strangely enough, always improving during the period of discharge. Other symptoms of the catarrhal child are usually present. On examination of the ear, the drum will show, during the active stage, a central or an anterior perforation, with thick mucoid discharge and very little injection of the drum itself. During the quiescent stage, the drum will be found to be retracted and dull, with a healed perforation in the form of a chalk-white scar, frequently kidney-shaped. These cases are due purely to a naso-pharyngeal infection, as a result of the presence of infected adenoids, which become infected most commonly as a result of a post-nasal discharge from infected sinuses. Needless to say, in such cases, removal of the adenoids and treatment of the sinus infection are all that is required, and the tonsils are best left alone.

Fifth Indication.

Chronically infected tonsils, often referred to as septic tonsils, are frequently given as an indication for tonsillectomy. The condition is observed in both children and adults, more commonly in the latter. The term septic tonsils is very widely and loosely used, and clinical evidence of chronic infection is very vague and indefinite. The history is not typical; in some cases there is a sensation of discomfort in the throat, occasional slight soreness, thick voice, known as woolly voice, bad taste in the mouth and sometimes bad breath.

On examination of the throat, the tonsils can be found to be enlarged, or on the contrary, small and buried. In the first case the condition is due to hypertrophic degeneration, and in the second to the development of a considerable amount of fibrous tissue with consequent shrinking. But the only proof of chronic infection would be histological examination showing these two types of changes in the tonsils, as well as the finding in swabs taken from the tonsils, of pathogenic organisms on a few occasions. Signs that would help the clinical evidence are the presence of enlarged tonsils, with persistent redness or flush of the anterior pillars, enlargement of the tonsillar glands or jugulo-digastric glands immediately below the angle of the jaw, often with tenderness on pressure, and liquid pus that can be expressed by pressure over the anterior pillar—not to be confused with debris expressed from the tonsillar crypts.

Diphtheria Carriers.

Nowadays the diphtheria carrier state as an indication for operation, fortunately, does not often present itself, thanks to the success of immunization. Before immunization became universal, diphtheritic tonsillitis could be seen fairly frequently, and often presented difficulty in its differentiation from acute virulent streptococcal tonsillitis with formation of a superficial layer of necrosis over the tonsil.

After an attack of diphtheria has occurred, the bacilli are apt to persist in the throat of a convalescent patient for as long as a month or six weeks after the disappearance of the exudate from the tonsils. Cases have been known to exist in which the bacilli persisted for as long as three months, and on rare occasions even up to a year. It is thought that, even now, about 0·5% to 1% of the population carry diphtheria bacilli, although only a small percentage of these are of a virulent type. It is also thought that the presence of adenoids often appears to be responsible for the unduly long persistence of the bacillus in children; needless to say, in such cases removal of the tonsils and adenoids is strongly indicated.

Sixth Indication.

Focal Infection.

This is another very controversial subject; opinion is divided as to the guilt or otherwise of the tonsils in many cases of systemic affections.

From studies of the defensive arrangements of Waldeyer's ring, which have been proved and emphasized by clinical observations, it was shown that most generalized diseases in children take origin from the upper part of the respiratory tract — namely, the naso-pharynx and oro-pharynx.

Cervical tuberculosis, as was mentioned earlier, is fairly common in young children, and the portal of entry is the tonsil. In other cases, the line of defence is in the nose and the lymphadenoid tissue of the naso-pharynx; and although the organisms often fail to produce generalized infection of the host, the organisms trapped there may retain full virulence. When local resistance is lowered by poor and unhygienic living conditions, the orgnisms, of course, may gain the upper hand.

Many infectious diseases are thought to gain entrance into the body through unhealthy tonsils. As I mentioned earlier, the tonsil is the commonest site of implantation of diphtheria. It is also probable that the same occurs in scarlet fever, and it is thought now that it is a possibility in measles. It is also suspected in cases of articular

rheumatism, as well as in cases of severe fibrositis, and is also sometimes blamed for certain forms of nephritis.

In addition, the tonsils are in many cases responsible for unexplained rises and falls of temperature, with generally poor health, either in children or in adults. However, I must stress the importance of the following two points when blaming the tonsils for being the seat of focal infection responsible for some systemic affection. First, evidence of chronic infection must be present in them; that evidence, such as it is, was discussed earlier. Secondly, other organs must be excluded as possible sites of focal infection—namely, chronic infection in the teeth and gums, the gall-bladder, the appendix and, last but not least, the genito-urinary system.

Conclusion.

Finally, I wish to add here (though this is not strictly a contraindication in the proper sense) the following observation. Though the operation for removal of tonsils and adenoids in itself is a simple and relatively safe procedure, which can easily be performed by the majority of medical practitioners with various grades of completeness, it has, nevertheless, its difficulties and complications. Post-operative ear infections, although not very common, do occur. Cross infection in children in hospitals is quite common, and is a definite risk. The risk of hæmorrhage, particularly where there is a family history of excessive bleeding, is fairly serious, and precautions must be taken before and after the operation. Last, but not least, there is the mental stress and trauma to which young children are subjected, not to mention the anxieties of the parents.

Reference.

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TONSILLECTOMY: PATHOLOGICAL CONSIDERATIONS.[1]

By K. C. PORTER,
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THE following paper presents a summary of histopathological findings in 48 tonsils removed at the Ballarat Base Hospital in a period of one month (mid-January to mid-February, 1957).

The cases studied were evenly distributed among the sexes, and cover tonsillectomies performed in the public, intermediate and private groups. The age distribution of the patients was as follows: four to five years, 20; six to seven years, eight; eight to nine years, five; 10 to 11 years, four; 12 to 13 years, two; 14 to 15 years, two; over 15 years, seven. This peak of cases before the age of six years is probably related to parental pressure and a desire to have the tonsils removed before starting school.

However, the curve of a graph plotted from these figures is parabolic; for this a simple formula can be obtained, which will probably correlate tonsillectomy to the population at risk in each age group. It is of interest to note that over the age of nine years every single patient was of female sex. I would not suggest that under nine years tonsillitis is more common in boys than in girls, or that over that age it is more common in girls than in boys. It is possible that over the age of nine years, parents pay more attention to their daughters' well-being than to that of their sons, and certainly among adolescents and adults the female pays more attention to her health than the male, an observation which can be made in any surgery waiting room or in any practitioner's ledger of professional services. However, the numbers examined are far too small to permit any safe conclusions.

With regard to the histopathological findings in the groups studied, I must preface any results with the reminder, first, that the tonsil is a collection of lymphatic tissue, and secondly, that it is in a position adjacent to a free surface of the body. Because of this latter point, the tonsil has a covering of squamous epithelium, which, consistent with such a surface anywhere, is continually desquamating effete cells. This must be borne in mind in any attempt to judge the implications of cryptic discharges. The first point has its own very important significance—namely, that lymphatic and reticulo-endothelial tissue presents a notoriously difficult field for study either functionally or structurally.

Several physiological points have emerged from this study. (i) An enlarged tonsil is an indication that it is reacting in the manner it should, in order to discharge its basic function as a first-line defence area. Histologically, there is a close correlation between the degree of hyperplasia and the degree of macroscopic enlargement. To remove a tonsil on the grounds of no other reason than simple enlargement is a "criminal assault" on the future integrity of that body. (ii) With increasing age, the tonsil plays a less important part in defence (preformed antibodies supersede new antibody formation). Hyperplasia of follicles gives way to relatively increased ratios of stromal tissue. This is a normal development, and is not a sequel to mere exposure to infection and chronic inflammation. My reasoning covering this point is somewhat involved and not of great importance to the discussion this evening. (iii) Discharges and exudates consisting of non-particulate and formed elements are a normal finding and can be seen in almost all crypts. I have come to regard inflammation and repair in the tonsil as microscopically identical with those states in any other tissue—namely, acute inflammation is indicated by extravasated red blood cells and/or polymorphonuclear infiltration. Repair is indicated by orderly sequence of round-cell and plasma cell infiltrations, histiocytic and fibroblastic proliferation and the formation of well-organized replacement fibrosis.

Subacute and active chronic inflammation consist of various combinations of the findings in acute inflammation and repair. I am not so foolish as to hold that inflammation or infection is without effect upon the essential lymphoid tissue or the surface epithelium. In fact, the latter shows infiltration with inflammatory cells (polymorphonuclear round cells and plasma cells) and increased desquamation. However, techniques to show the effects upon the lymphoid tissue are unnecessary if one is required to arrive at a decision as to the occurrence or not of any inflammation, past or present, in the tonsil. In none of the tonsils examined was there any evidence of granulomatous inflammation or of any other pathological change such as metaplasia or neoplasia. The only justification for tonsillectomy on such grounds would be localized carcinoma arising in the epithelium covering the tonsil. To summarize my criteria as follows: Evidence of acute inflammation would be polymorphonuclear infiltration and red blood cell extravasation. This latter may be either into the tissues or into the crypt. Evidence of past inflammation would be round cell infiltration (difficult to elucidate in the lymphoid tissue) or plasma cell infiltration, histiocytic and fibroblastic proliferation and/or replacement fibrosis. This last-mentioned is, I find, comparatively easy to differentiate from stromal tissue in the younger age groups. I believe it is equally so in the older ages but my numbers are too small to be certain.

Based upon the foregoing criteria, the findings in the 48 tonsils examined were as follows: acute inflammation, 14; active chronic inflammation, four; significant replacement fibrosis (indicating past attacks), six; that is, about 50% of the tonsils examined showed evidence of significant pathological change and 58% of these showed acute inflammation, not chronic inflammation. Whether this was significant enough to warrant removal of the tonsils is something I am not prepared to comment on, except to generalize that simple inflammation *per se* seldom is sufficient evidence for operative removal, for example, as in cases of nephritis, enteritis, hepatitis, cystitis, endocarditis, otitis, pneumonitis, rhinitis, gastritis, glossitis, etc. I do not, of course, include suppuration, ulceration or perforation in this category.

[1] Read at a meeting of the Ballarat and District Base Hospital Clinical Society, May 29, 1957.

Reports of Cases.

CHRONIC NON-PUERPERAL INVERSION OF THE UTERUS.

By Charles V. Salisbury, Warwick Newman and Garry Scarf,
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Chronic inversion of the uterus is a rare displacement. In the majority of cases it commences as an acute inversion during the third stage of labour, and in the remaining few cases it is non-puerperal and is usually associated with the presence of a tumour growing, as a rule, from the upper part of the uterine cavity.

The most frequent type of neoplasm seen in reported cases is a fibromyoma which has undergone sarcomatous change. This type of tumour usually grows rapidly and becomes heavy and bulky, whilst at the same time the increased vascularity of the uterine walls causes softening of the uterus. It is these two factors which predispose to the occurrence of this displacement. The heavy uterine tumour pulls the softened fundus down towards the cervix, whilst uterine contractions then force the now inverted fundus through the cervix into the vaginal cavity. Finally, the whole of the uterus may be displaced through the cervix, and it may even be present at the introitus.

The rarity of non-puerperal inversion is borne out by the fact that such well-known gynæcologists as Victor Bonney and Comyns Berkeley state that they have never operated on this condition, while Te Linde does not even mention the operative treatment of inversion in his comprehensive gynæcological surgical textbook.

The treatment of chronic inversion can be divided into conservative measures, such as gradual replacement by taxis using some type of vaginal repositor (e.g. Aveling's repositor), or by more radical measures either through the vagina by the technique recommended by Spinelli, or through the abdomen by the method devised by Haultain. If the condition is secondary to a neoplasm of the uterus, radical surgery is usually indicated.

Clinical Record.

Mrs. A., aged 69 years, was admitted to St. Vincent's Hospital, Sydney, through the casualty department on July 19, 1957, suffering from acute retention of urine of over 24 hours' duration. Also, she gave an eight month's history of irregular hæmorrhage. A catheter was passed into the bladder and three pints of urine were removed, and a vaginal examination was carried out. There was a profuse, offensive, sanguinous vaginal discharge, and it was discovered that the vagina was completely occluded by a hard, rubbery, irregular mass which was also protruding through the introitus, thus preventing bimanual examination. The following day, while the patient was under anæsthesia, the vaginal mass, which was friable, was removed by blunt dissection with the fingers; this procedure revealed a red, inverted pyriform swelling which occupied the upper half of the vaginal canal. This mass was smooth and dark-red in colour, and bled slightly on palpation. The cervix could not be seen or palpated, and an examination revealed the absence of the uterine body from its normal position. It was thought advisable to await the result of the microscopic examination of the vaginal growth before proceeding with any further treatment and at the same time to treat the local vaginal infection. One week later the pathological report revealed that the neoplasm, which weighed 10 ounces, was a myosarcoma of intermediate grade of malignancy, and it was then decided to carry out a panhysterectomy by the abdominal route.

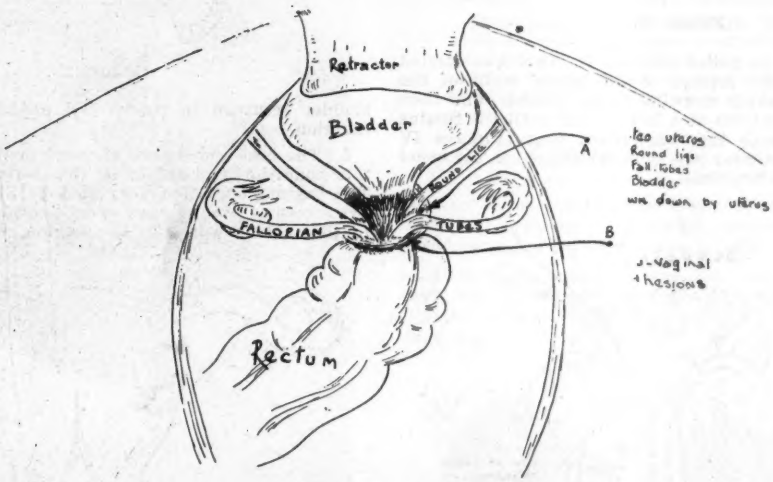

Figure I.
A, inverted uterus with round ligaments, Fallopian tubes and bladder drawn down by uterus; B, recto-vaginal adhesions.

At this operation an attempt was made to reduce the inversion by manual pressure on the inverted uterus before opening the peritoneal cavity, but this was not persisted in, as the uterus was friable, and it was thought that the uterus might be perforated and thus the peritoneal cavity might be infected.

When laparotomy was performed, the uterus was found to be completely inverted, and both ovaries were pulled down to the rim of the uterine wall which formed the lip of the inverted uterine cup. The medial ends of the uterine tubes and round ligaments had disappeared into the depression, and a bladder fold had been drawn into the anterior part of the depression (Figures I and II). The forefinger was inserted into the cup and the constriction ring palpated. An attempt was made to stretch the ring by using Hegar's dilators, but dilatation was not sufficient to allow reduction to take place, mainly because the uterus

was thick and œdematous. The inversion was then reduced by the technique advised by Haultain of making a three-inch posterior vertical incision through the uterus, cervix and upper fourth of the vagina (Figure III). Hegar's dilators were then inserted into the inverted cup, and the constriction ring was further stretched to allow the

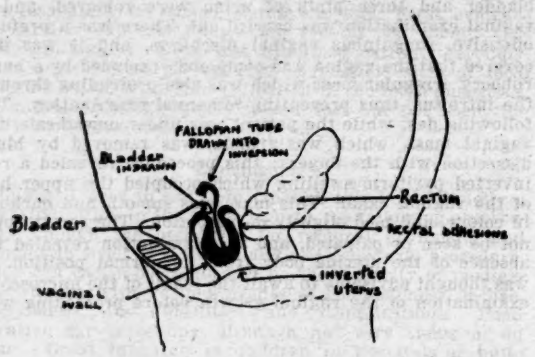

FIGURE II.

inverted fundus to be pulled through it. This was carried out by applying Allis forceps to the lateral walls of the inverted cup and slowly drawing them upwards, and then taking several more bites at a lower level until the fundus was delivered through the constriction ring (Figures IV and V). Panhysterectomy was then carried out in the usual way without any difficulties.

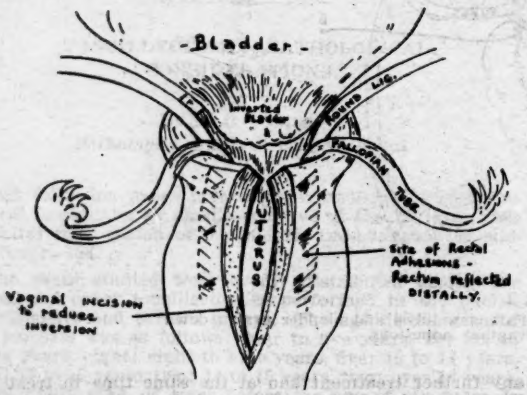

FIGURE III.

On completion of the panhysterectomy, a hard mass was palpated and seen in the large bowel at about the level of the pelvi-rectal junction; this mass had the characteristics of a malignant neoplasm. After the closure of the abdomen, a sigmoidoscopic examination revealed a firm constriction of the bowel 15 centimetres from the anal canal, and a biopsy was taken distal to this constriction. This biopsy consisted of normal mucosa, and X-ray examination with a barium enema one week later revealed that the mass in the bowel was of an inflammatory nature secondary to diverticulitis.

Comment.

There are several interesting features in this case worthy of comment.

1. The patient presented for examination suffering from acute retention of urine. This retention was probably brought about in a manner similar to that sometimes seen in patients with a retroverted gravid uterus. In this case, the vaginal growth lifted the bladder high above the level of the *symphysis pubis;* and this displacement caused lengthening and narrowing of the lumen of the urethra at the same time. This combination of the displaced bladder and the partial occlusion of the urethra brought about the retention of urine. After removal of the neoplasm, the

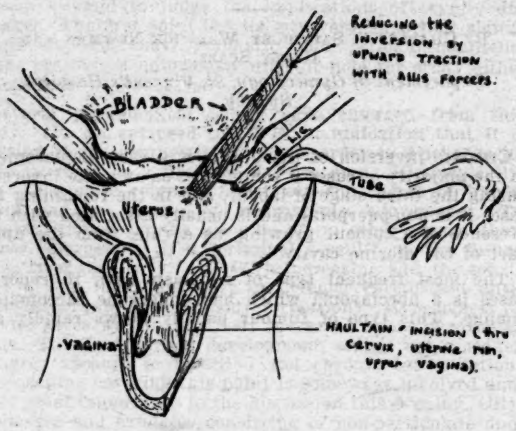

FIGURE IV.

bladder returned to its normal anatomical position and function.

2. The best and easiest surgical method of dealing with this condition appears to be that advocated by Haultain. The vaginal operation suggested by Spinelli or a vaginal hysterectomy would have been technically difficult owing to the lack of space in the vagina, which was partially

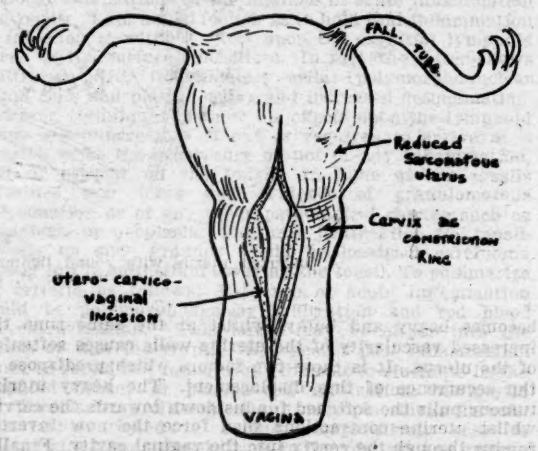

FIGURE V.

occluded by an inverted uterus. As well as this lack of space in the vagina, there was an added danger of injury to the bladder and perhaps to the rectum. A small fold of the bladder had been drawn into the cup formed by the inverted uterus, and this displacement of the bladder might have made the separation of the bladder from the cervix difficult and risky. The rectum had also been drawn upwards towards the rim of the inverted uterus, and this displacement might have made entry into the pouch of Douglas difficult and dangerous.

3. Slow reduction of the inversion by the insertion of an Aveling repositor after the removal of the sarcoma was considered, but was not used. The uterus appeared to be very friable, and it was thought that any sustained pressure might have perforated it.

AN UNUSUAL INDICATION FOR HYSTERECTOMY.

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Miss X, aged 19 years, and engaged to be married, was admitted to a suburban hospital on March 18, 1957, with pelvic peritonitis, possibly from an ectopic pregnancy. She had been well until three days before her admission, when she developed lower abdominal pain, which gradually spread over the entire abdomen. This was followed by diarrhœa and scalding and frequency of micturition. She desisted from calling a doctor until the day of admission to hospital, when the pain became more severe and

FIGURE I.

A view of the uterus from above, showing a large gaping cavity in the fundus.

vomiting was incessant after a dose of castor oil. She assumed that she was pregnant, as she had had three months' amenorrhœa, but she firmly denied interference.

On examination, the patient was a very sick young girl. Her temperature was 102·4° F., her pulse rate was 140 per minute, and she was dehydrated and very toxæmic. Tenderness was present over the lower part of the abdomen, with guarding and rigidity. From the cervix a blackish discharge was escaping, but bimanual examination was so painful that very little information could be gained. The cervix appeared closed.

Although interference was suspected, the patient emphatically denied this. In any case a laparotomy was essential, if only to inspect the appendix. When the abdomen was opened, the upper half of the uterus was found free in the pelvis—a blackish, necrotic mass, at first mistaken for the placenta. The lower half of the uterus appeared as a gaping cavity, similarly discoloured, very friable, but not too malodorous. In fact, in the abdomen there was a singular lack of odour. The appendix and the rest of the contents of the abdomen were normal. Swabs for bacteriological examination were taken from the abdominal fluid and from the necrotic uterus.

In view of the gravity of these findings, and as the girl was a minor, her parents were quickly summoned and told that hysterectomy was the only hope. With resuscitative measures, a total hysterectomy was performed—total, as the discoloration of the remnant of uterus *in situ* extended down so far, and subsequent histological examination confirmed these findings. The ovaries were conserved.

With careful nursing and massive chemotherapy, including gas-gangrene antiserum, penicillin, streptomycin and sulphonamides, and with attention to details of intravenous therapy by biochemical control, her convalescence was remarkably smooth. The pathological report on the specimen and bacteriological findings in the smears made by Dr. A. Garven is as follows:

> Macroscopic: The specimen consists of a uterus and cervix measuring 9 cms. in length. The fundus is replaced by a deep crater with ragged margins, and on cutting the uterus this area of necrosis is seen to extend for 1 cm. into the myometrium. Within the endocervix there is another soft purplish zone of apparent necrosis. In a separate jar there are numerous fragments of white friable material and blood clot.
>
> Microscopic: Section through uterine wall shows a narrow zone of myometrium on which is a thick layer of necrotic tissue containing several large foci of polymorphs. Sections from the material in the other bottle show similar necrotic tissue and fibrin, and NO placental tissue.
>
> Bacteriology: A Clostridium organism—not *Welchii*—was cultured from the vaginal discharge, from the uterus, and from the fluid in the abdomen.

It was disconcerting to be told that there was no definite sign of pregnancy; however, examination of further sections taken revealed necrotic villi.

After three weeks in hospital, the wound had healed well and drainage from the site of the tube had ceased. Vaginal drainage was down to a minimum. The patient was well.

FIGURE II.

The piece of tissue on the left, the top of the uterus, was lying free in the abdominal cavity. On the right is the uterine remnant removed.

In the immediate post-operative period, when her prognosis was uncertain, she volunteered certain information of interest. She had been sent by a friend to a doctor somewhere, who did "something down below", a few hours preceding the onset of her pains four days before her admission to hospital.

This girl was examined recently at the out-patient department. She is back at work, has gained two stone in weight and appears fairly happy under the circumstances. Figures I and II show the picture found at laparotomy.

Acknowledgement.

I wish to thank Mr. J. Sullivan, of the Photographic Department, St. Vincent's Hospital, Melbourne, for the two photographs.

RESOLUTION OF CHLORPROMAZINE JAUNDICE WITHOUT WITHDRAWAL OF THE DRUG.

By W. H. Trethowan and J. W. Shand,
From the Department of Psychiatry, University of Sydney.

The occurrence of jaundice as a complication of chlorpromazine therapy has now been widely reported. The incidence varies, Pollack's (1956) estimate of 0·5% to 5·0% probably representing the usual range.

On analysis of many of the recorded cases, the main features of the syndrome appear to be as follows:

1. Jaundice usually appears during the second or third week after treatment has begun; exceptionally after a longer period. Its occurrence is not related to daily or total dosage. It occasionally follows cessation of chlorpromazine therapy (Elkes and Elkes, 1954; Isaacs *et alii*, 1955).

2. There may be a prodromal period of malaise, consisting sometimes of pyrexia, and usually of anorexia, nausea, colic and other gastro-intestinal symptoms (Lomas, 1955). These usually precede the onset of jaundice by a few days. In some cases the same symptoms occur and persist for a while without jaundice becoming clinically apparent (Kinross-Wright, 1955; Stacey *et alii*, 1955). Because the results of liver function tests may be found to be abnormal in such cases, this state is probably best regarded as one of sub-icteric cholangiolytic hepatitis.

3. The jaundice appears to be of obstructive type; the serum bilirubin, alkaline phosphatase and cholesterol levels are elevated. Characteristically, tests for parenchymal liver damage continue to give negative results (Werther and Korelitz, 1957). Eosinophilia may also be present (Hartnett, 1955; Morgan, 1956). The general consensus of opinion is that chlorpromazine jaundice is due to an idiosyncrasy to the drug (Cohen and Archer, 1955), an allergic reaction resulting in biliary obstruction.

4. Although jaundice may continue for several months, its duration is usually limited to a few days or weeks following cessation of treatment. The condition may be regarded as essentially benign (Goldman, 1956; Pollack, 1956), although a few fatalities have been recorded. However, according to Werther and Korelitz (1957), in each of the fatal cases investigation revealed that in none was death unequivocally attributable to chlorpromazine alone; other complicating factors were also present. For example, in the case reported by Boardman (1954), an enlarged nutmeg liver due to passive congestion, the result of congestive cardiac failure, was present in addition to toxic hepatitis. In most cases recovery from chlorpromazine jaundice appears to be complete without residual liver damage, although in Hartnett's (1956) case an increase in urinary urobilinogen excretion was found to persist for six months after apparent recovery.

5. In most cases in which chlorpromazine therapy has been recommenced after the subsidence of jaundice, this has not recurred, though exceptions have been periodically recorded (Seager, 1955; Ayd, 1956; Pollack, 1956).

While most authors regard the occurrence of jaundice as a contraindication to further chlorpromazine therapy (Lomas *et alii*, 1955; Sainz, 1956), at least until this has completely resolved, it is clear, though not generally accepted, that in some cases administration of the drug may be continued unchecked without untoward results (Isaacs, *et alii*, 1955; Pollack, 1956; Annotation, 1956). That this is possible may be of importance in certain cases, either when alternative methods of treatment are less satisfactory, or when it is anticipated that sudden withdrawal of the drug may result in a severe exacerbation of the symptoms for which it was originally prescribed. Furthermore, it may be found that after such an exacerbation, the effect obtained is much less satisfactory than that produced initially (Trethowan and Scott, 1955). Because this may be a matter of some importance, the history is presented of a patient who developed jaundice while undergoing chlorpromazine therapy, and in whom this satisfactorily resolved without cessation of the treatment.

Clinical Record.

A male patient, aged 32 years, was admitted on May 10, 1957, to the Royal Prince Alfred Hospital, Sydney. His history was that of a depressive illness beginning in August, 1956, and varying in severity over some months. He was treated conservatively elsewhere with sedation and psychotherapy, and had not received chlorpromazine either during this or at any other time. There was no history of any related condition or of previous liver disease. In April, 1957, his depression finally lifted, and he thereupon developed an attack of hypomania, which increased during the next few weeks to the proportions of a full-blown mania.

On his admission to hospital, his condition was typical of a moderately severe manic state. He was over-active, elated though irritable, garrulous with flights of ideas, and had little insight. He looked ill, having lost weight, but there were no abnormal physical signs in any system.

Treatment with chlorpromazine was begun immediately. For the first three days he was given 400 milligrammes daily, and the dose was increased to 800 milligrammes per day thereafter. This largely controlled his manic symptoms; although still somewhat overactive and irritable, he became quieter and more cooperative, and started to gain weight and sleep well without other sedatives. At the end of the first week of treatment he developed a stiffness of gait of Parkinsonian type.

Fourteen days after his admission to hospital, by which time he had received a total of 11 grammes of chlorpromazine, he complained for the first time of mild colicky abdominal pains, nausea and anorexia. Although these symptoms gradually resolved, after three days jaundice appeared, together with bile in the urine and pale offensive stools. His liver now became palpably enlarged to one finger's breadth below the costal margin, and slightly tender.

Because it was thought that withdrawal of chlorpromazine would almost certainly result in an acute exacerbation of his mental symptoms, it was decided to continue with the same dosage as before.

During the period of jaundice, serial liver function tests, eosinophil counts and some other investigations were carried out. The results of these in relation to the clinical course of the jaundice are set out in Table I.

On May 31, four days after the onset of jaundice, liver biopsy was performed. Dr. V. J. McGovern reported on this as follows:

> The architecture of the liver is normal. The portal tracts are enlarged due to disappearance of liver cells and there is cellular infiltration composed of eosinophils. In the centres of the lobules there are small intracellular bile plugs. The appearance in general conforms to that seen in chlorpromazine jaundice.

On June 1, after the jaundice had persisted for five days, treatment with prednisone was begun, as follows: 60 milligrammes per day for two days, 40 milligrammes per day for the next two days, 30 milligrammes per day for a further two days; thereafter 20 milligrammes per day, the dosage gradually tapering off until administration ceased on June 16.

By June 7, all clinical signs of jaundice had completely disappeared, and the patient's urine and stools were normal. The results of liver function tests became normal by June 19, twelve days later. A biopsy carried out on July 2 showed the liver to be normal apart from the presence of an occasional eosinophilic leucocyte in the portal tracts.

Throughout this period chlorpromazine therapy was continued as before, without recurrence of jaundice or further complication. Over the next few weeks the dosage was gradually lowered to 200 milligrammes per day, and this amount was still being given nine weeks after the patient's jaundice had resolved.

TABLE I.
Results of Liver Function Tests, etc.

Day of Treatment.	Serum Bilirubin Content. (Milligrammes per 100 Millilitres.)	Serum Alkaline Phosphatase Content. (Units.)	Leucocytes per Cubic Millimetre.	Eosinophils. (Percentage.)	Serum Protein Content. (Grammes *per Centum*.)	Serum Cholesterol Content. (Milligrammes per 100 Millilitres.)	Thymol Flocculation.	Zinc Sulphate Turbidity. (Units.)	Jaundice.	Prednisone. (Milligrammes per Day.)
18	5·0	43·0	..	..	..	..	+	4·5	Present.	..
19	7·4	40·0	8800	14	..	..	..	..	Present.	..
20	8·6	44·5	..	..	7·6	330	—	5·0	Present.	..
21	11·0	47·5	9300	20	7·45	350	—	5·5	Present.	..
22	13·3	51·0	9600	1	7·4	302	—	6·5	Present.	60
23	9·7	47·5	7900	2	8·2	314	+	6·5	Present.	60
24	5·8	42·0	..	..	7·1	315	—	7·0	Present.	40
25	4·2	35·0	9600	0	7·1	330	—	7·0	Present.	40
26	3·2	37·0	12,700	9	7·45	320	—	6·0	Present.	30
27	2·3	32·5	..	..	..	..	+	4·5	Less.	30
28	1·2	28·0	..	..	..	..	+	5·0	Much less.	—[1]
30	0·6	27·0	9000	7	7·25	247	+	5·5	Fading.	—
31	0·6	20·5	..	..	..	..	—	5·5	——	—
40	0·4	4·0	..	..	..	..	..	..	——	—
48	0·4	14·0	..	..	..	..	..	..	——	—

[1] Dosage reduced; withdrawn on sixteenth day of treatment.

Comment.

There is no doubt that the jaundice from which this patient suffered was a reaction to chlorpromazine. In both its clinical and biochemical aspects, it closely resembled many of the other cases described, the principal features of which have already been outlined.

Whether or not this patient's jaundice would have resolved so readily had prednisone not been given is difficult to decide. It is probable that the fall in the eosinophil count which followed the administration of prednisone, and to which it was clearly due, reflected the start of the subsidence of the whole reaction. The effect of ACTH and cortisone on allergic and sensitivity reactions is now well established. In a large number of patients treated with chlorpromazine by Goldman (1956), when skin sensitivity reactions occurred, these were apparently well controlled by small doses of ACTH. In five cases of jaundice described by the same author, in every case this lasted less than 10 days and also responded to ACTH and withdrawal of chlorpromazine.

In the present case, however, the drug was not withdrawn. Although successful resolution of the patient's jaundice occurred within 11 days of its appearance and there were no residual sequelæ, the question of how wise it is not to withdraw the drug needs further consideration. In mild cases its administration may probably be continued with little risk. Indeed, if, as seems likely, attacks of gastro-intestinal discomfort occurring 10 to 14 days after treatment has begun are due in fact to mild hepatitis which does not proceed to frank jaundice, in many cases reported the condition must clearly have resolved without withdrawal of medication.

However, until more is known it would probably seem wise to discontinue the administration of chlorpromazine when jaundice occurs, especially if the reaction appears to be severe, and also when some satisfactory alternative method of treatment exists. In the event of coexistent liver disease, if chlorpromazine is prescribed at all, it should be withdrawn at once should any symptoms suggestive of further hepatic disturbance occur.

In the present case chlorpromazine was prescribed on account of manic symptoms. These, as a rule, are readily controlled by this agent, and much less readily so by other means. Indeed, it may be said that chlorpromazine has almost a specific effect in suppressing manic excitement. This provided justification for continuing with treatment while keeping the patient under the closest possible clinical and biochemical observation.

Summary.

The case of a patient in whom jaundice developed during treatment with chlorpromazine is described.

Although treatment with chlorpromazine was continued as before, the attack of jaundice resolved satisfactorily within 11 days without recurrence or residual liver damage.

Certain implications are discussed.

Acknowledgements.

The authors wish to acknowledge the help of Dr. V. J. McGovern in examining and reporting on the liver biopsies, and also that of Professor C. R. B. Blackburn for advice on the management of this case.

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Reviews.

Modern Perinatal Care. By Leslie V. Dill, M.D., F.A.C.S.; 1957. New York: Appleton-Century-Crofts, Incorporated. 9¼" × 6¼", pp. 322, with 50 illustrations. Price: $6.50.

IN view of the success of Professor F. J. Browne's classic monograph on ante-natal and post-natal care (now in its eighth edition), it is not surprising that a comparable volume should, sooner or later, be published from the other side of the Atlantic. Such is "Modern Perinatal Care", by Leslie V. Dill, of Washington, D.C.

The general form of the two books is not dissimilar. They deal first with such matters as the diagnosis and hygiene of pregnancy, including nutritional requirements, pass on to a detailed chapter on pregnancy toxæmia and on each of the more common medical complications of pregnancy, and conclude with an excellent chapter on post-natal care. Incidentally, we should like to see a chapter in books such as this on "prenatal pediatrics"—a study of methods of ensuring, as far as possible, the welfare of the infant *in utero* from conception until parturition. This theme has been ably developed by Dr. Kate Campbell, of Melbourne, on several occasions.

The author of the present work has commendably given a useful historical background to present-day obstetrics and has broken new ground with a chapter on the ethics of the Roman Catholic Church in relation to many obstetrical and gynæcological conditions. As befits a first edition of a book such as this, the author has taken the opportunity to "debunk" some once-cherished ideas held in relation to pregnancy and parturition, and there is little of this with which we would disagree.

Perhaps one of the best aspects of this book is the way in which the post-war literature on the subject of ante-natal and post-natal care is reviewed and the conclusions therein are either accepted or discarded, the whole being orientated towards the working conditions of the practising obstetrician in the U.S.A.

Although evidence of possible radiation hazards by diagnostic over-use of X rays during pregnancy is too recent to find mention in this volume, the chapter on pelvic mensuration rightly stresses the importance of clinical assessment of the pelvis and discourages excessive reliance on X-ray pelvimetry. There is a thoughtful chapter on the "fourth stage of labour" (the first 24 hours after delivery), as well as a section on breast feeding; another chapter is devoted entirely to the problem of *erythroblastosis fœtalis*.

In his chapter on fœtal and neonatal mortality, Dill makes out a good case for a revision of the term "birth injury" with its unfortunate connotation, stressing the fact that subarachnoid and intraventricular hæmorrhages are undoubtedly anoxic rather than traumatic in origin. He suggests that the occurrence of anoxic intracranial hæmorrhage is more closely related to the incidence of prematurity, ante-partum hæmorrhage and maternal toxæmia than to any difficulties at the time of delivery.

There is a welcome atmosphere of reasonable conservatism about this book; admittedly it does not deal with techniques for the management of normal or abnormal parturition, but one is left with the impression that patience, combined with intelligent anticipation, is still a desirable attribute in the obstetrician, wherever (to borrow a favourite word from this author) his "locale".

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"The Surgical Clinics of North America, Philadelphia Number, December, 1957: Common Operations—Refinements in Technique"; Consulting Editor, Jonathan E. Rhoads; 1957. Philadelphia and London: W. B. Saunders Company. Melbourne: W. Ramsay (Surgical), Limited. 9" × 5¼", pp. 265, with 78 illustrations. Price (six issues per year): £8 2s. 6d. (cloth binding), £6 15s. (paper binding).

Contains 18 articles on refinements in the technique of common operations. Emphasis is placed on "relatively simple, straightforward maneuvers and on refinements in technique with which the several authors have had a satisfying and direct personal experience".

"The Medical Clinics of North America, Boston Number, September, 1957: Diagnosis in General Practice"; Guest Editor, Chester S. Keefer, M.D.; 1957. Philadelphia and London: W. B. Saunders Company. Melbourne: W. Ramsay (Surgical), Limited. 9" × 5¼", pp. 325, with 166 illustrations. Price (six issues per year): £8 2s. 6d. (cloth binding), £6 15s. (paper binding).

Contains a symposium of 20 articles on various aspects of diagnosis in general practice.

"Tumors of the Soft Somatic Tissues: A Clinical Treatise", by George T. Pack, M.D., LL.D., F.A.C.S., and Irving M. Ariel, M.D., F.A.C.S.; 1958. New York: A Hoeber-Harper Book. 10" × 6¼", pp. 804, with 652 illustrations. Price: $30.00.

A comprehensive work on the classification, natural history, pathology and treatment of tumours of the soft somatic tissues.

"Frazer's Anatomy of the Human Skeleton", edited by A. S. Breathnach, M.D., M.Sc.; 1958. London: J. and A. Churchill, Limited. 11" × 7¼", pp. 254, with 197 illustrations. Price: 50s. (English).

This book was first published in 1914. The original approach has been made, but the material has been brought up to date.

"Modern Treatment Yearbook 1958: A Yearbook of Diagnosis and Treatment for the General Practitioner", edited by Sir Cecil Wakeley, Bt., K.B.E., C.B., LL.D., M.Ch., D.Sc., F.R.C.S., F.R.S.E., F.R.S.A., F.A.C.S., F.R.A.C.S.; 1958. London: Baillière, Tindall and Cox, Limited. 8¾" × 5¼", pp. 344, with nine illustrations. Price: 27s. 6d. (English).

Contains 31 articles on various aspects of treatment.

"Pediatric Clinics of North America, August, 1957." Philadelphia and London: W. B. Saunders Company. Melbourne: W. Ramsay (Surgical), Limited. 9" × 5¼", pp. 221, with illustrations. Price: £6 15s. *per annum*.

Contains a symposium of 14 articles on handicaps and their prevention. Four sections deal respectively with the prevention of handicaps in children, the care of the child with handicaps, the education and training of children with handicaps and the community and the handicapped child.

"Pediatric Clinics of North America, November, 1957." Philadelphia and London: W. B. Saunders Company. Melbourne: W. Ramsay (Surgical), Limited. 9" × 6", pp. 377, with illustrations. Price: £6 15s. *per annum*.

Contains 11 articles on pædiatric endocrinology and eight articles on brain damage in children.

"Endocrine Aspects of Breast Cancer: Proceedings of a Conference Held at the University of Glasgow, 8th to 10th July, 1957"; edited by Alastair R. Currie, B.Sc., M.B., F.R.C.P. (Edin.); foreword by C. F. W. Illingworth, C.B.E., M.D., Ch.M., F.R.C.S. (Edin.), F.R.F.P.S.; 1958. Edinburgh and London: E. and S. Livingstone, Limited. 8¾" × 5", pp. 356, with many illustrations. Price: 37s. 6d. (English).

Contains the various papers in full with epitomes of the discussions.

"Polymyositis", by John N. Walton, M.D., M.R.C.P., and Raymond D. Adams, M.D.; 1958. Edinburgh and London: E. and S. Livingstone, Limited. 8¾" × 5", pp. 280, with 47 illustrations. Price: 32s. 6d. (English).

A critical analysis of a group of neuro-muscular disorders.

"The Mammalian Cerebral Cortex", by B. Delisle Burns, B.A., M.R.C.S., L.R.C.P.; 1958. London: Edward Arnold, Limited. 8¾" × 5", pp. 128, with illustrations. Price: 21s. (English).

The author is Associate Professor of Physiology, McGill University, Montreal.

"Biological Aspects of Cancer", by Julian Huxley, F.R.S.; 1957. London: George Allen and Unwin, Limited. 8¾" × 5", pp. 156. Price: 16s. (English).

Consists of two reviews already published in *Biological Reviews* with a considerable amount of new material.

"Medical Teleology and Miscellaneous Subjects", by F. Parkes Weber, M.A., M.D., F.R.C.P., F.S.A.; 1958. London: H. K. Lewis and Company, Limited. 8¾" × 5¼", pp. 94, with three illustrations. Price: 15s. (English).

A collection of the author's medical writings, most of which have been previously published in medical journals.

The Medical Journal of Australia

SATURDAY, APRIL 26, 1958.

MAN IN SPACE.

A VAST amount of effort is being put into investigations on the possibility of human travel outside the earth's atmosphere. The problems to be solved before this can be made possible, if ever it can, are many and very difficult, and all sorts of people are going into print on the subject. An important paper has, for example, recently been published by the Surgeon-General of the United States Air Force, General D. C. Ogle,[1] under the title of "Man in a Space Vehicle", and a series of papers (not all so important), delivered at a symposium held at Denver, Colorado, by seven experts on different aspects of space travel have also been published.[2] It is of interest to examine these expressions of fact and opinion.

Ogle writes wryly: "It is vogue in any scientific or research atmosphere to announce that we stand on the threshold of a great 'break through'. Any speaker who omits this break through routine is not up on current custom." This creates a somewhat intimidating situation, but we may still stand on our rights and ask for a sober assessment of the position. Certain facts appear to be well enough established. Space flight may be defined as that which requires the traveller to take his environmental needs with him in a sealed cabin or capsule. While a properly trained and selected man can fly up to thirty or forty thousand feet breathing oxygen and in a pressurized suit, beyond seventy thousand feet the thin air could not be sufficiently compressed and a totally sealed cabin would be necessary. This situation would apply to intercontinental rocket flights. However, some extraordinary statements are being made by people who should know better. Thus in an advertisement put out by one aircraft corporation is the statement: "A predicted breakthrough is the plasma engine which will harness ions or light itself to drive aircraft nearly 186,000 miles per second" (nearly 670 million miles per hour). As Ogle says, whatever the "plasma engine" may be, man himself continues to be the same old model, having enjoyed no engineering improvements since generations before the dawn of history. For space travel then, man must carry with him whatever is needed to sustain him adequately for the entire duration of any contemplated flight, including air, water, food and recreation, and must be able to eliminate or reconvert all waste materials. This might be possible for relatively short flights—say, to the moon—but it is envisaged that flights to Mars or Venus would take a year or more, and no practical means for keeping up these supplies for a lengthy period are yet in sight. There are plenty of imaginings, such as the growth of algæ to use carbon dioxide and produce oxygen and nitrogenous waste products to provide food and also artificial photosynthesis. An aspect which is being much studied at the present time is the effect of boredom, which would be very real in sustained travelling in soundless and lightless space, with the continued instrument-watching. It has been found that prolonged exposure to a monotonous environment has deleterious effects.

Leakages, even very small ones, will have increased importance when the space outside the capsule is at zero pressure, and these may result from contact with the many meteor particles of potentially dangerous size outside the earth's atmosphere. Not much is known yet about heat absorption from radiation and its loss, also by radiation, in space. The possible effects of high-voltage cosmic rays, which do not penetrate the earth's atmosphere, but can go through a foot of solid lead, are not yet known. It is possible that enough information is available to permit control of the effects of acceleration on the human body, but there is no indication yet as to how this can be done. The effects of the gravity-free or weightless state on man and methods of controlling this are being intensively studied, and it is known that some individuals react very badly to it, even for short exposures. It is claimed that the required gravity can be created by spinning the ship, but this introduces other difficulties. It thus appears that a very great deal has yet to be learnt about the physiological effects of the various factors, known and unknown, involved in space travel. We may be able, in the future, probably distant, to select and adapt human beings for special environmental circumstances by physiological means. An incidental matter of some importance is the provision of escape mechanisms to use if the space ship is damaged. A. M. Mayo points out that, since both the mother craft and any escape device will continue to travel indefinitely at constant velocity in space, it is evident that the average time for rescue after separation must be assumed to be relatively long. This means that adequate air, water and food, as well as apparatus for sending and receiving messages, must be included in the escape mechanism. Pressure and temperature must also be regulated. It is obvious that the escape mechanism is going to be quite large.

An important opinion amongst the many in this series of papers is that of an astronomer, W. O. Roberts, of the High Altitude Observatory, University of Colorado. His ideas as to the possibility of space travel by man in the near future are expressed very forcibly. He doubts the possibility of space travel for man in this generation, excepting for the first few hundred miles for a few hardy souls. In regard to outer space, he points out that, even if one could travel at the improbably fast speed of 50 million miles per hour (round the world in one second), it would still take forty years or so to reach the nearest star, with perhaps one chance in a million of finding a planet with suitable environment. Even within the solar system he is

[1] *U.S. Armed Forces M. J.*, 1957, 8:1561 (November).
[2] *J. Aviation Med.*, 1957, 28:479 (October).

frankly pessimistic about space travel for humans. On the other hand, there seems to be general agreement that, given time, money and skill, space travel for non-manned vessels is now possible and could yield very valuable information on a number of topics. A more intriguing but correspondingly more speculative subject is the possibility of "an inhabitable extraterrestrial environment reachable from the earth". Discussing this, H. Strughold points out that, for life as we know it, there must be an atmosphere containing oxygen, carbon dioxide and water, with a temperature within certain limits. The sun has little or no effect in warming any planet other than Venus, Earth, Mars and Mercury; so the temperatures on the other planets are permanently a long way below freezing point. Mars, Earth and possibly Venus are the only planets with oxygen, carbon dioxide and water. Little is known about Venus because of the dense clouds of carbon dioxide. On Mars the pressure corresponds to an altitude of about 55,000 feet in our atmosphere, and the oxygen content of the atmosphere at ground level on Mars is less than 0·12 volume *per centum*. In the event of a leak in the sealed compartment or in the pressure suit, the astronaut would encounter the same rapid decompression effects, including anoxia and air embolism, as pilots encounter in the earth's atmosphere at 50,000 to 55,000 feet (about 10 miles). The intensity of daylight and the day-night cycle on Mars would be satisfactory for man. The temperature varies daily between 25° C. and −45° C.: so some source of warmth would be necessary during the night. The figures given have a high degree of probability, but no more.

What is the overall picture? Restless, curious man continues to ask the experts, and no doubt his medical adviser also is interested to know what new factors, harmful or otherwise, are likely to be added to the increasingly complex human environment. In summary, the probability seems to be that it is now, or soon will be, possible to place chambers containing instruments on the moon and the nearer planets, but that it will be a long time, if ever it is done, before man will be able to go far outside the earth's atmosphere. The question need not trouble the present revisers of our standard medical text-books.

Current Comment.

MECHANICAL FACTORS IN GASTRO-ŒSOPHAGEAL REGURGITATION.

THE observations recorded by Paul Marchand[1] upon intrapleural and intraœsophageal pressures are remarkably simple, perhaps deceptively so, but they indicate once again that with a little ingenuity and thought some useful contributions to medical knowledge can still be made without recourse to highly complex apparatus and an army of specialists and statisticians. With a thin polythene catheter and a manometer he first shows that the œsophageal hiatus moves downwards on inspiration. By appropriate positioning of the catheter just below the hiatus a diphasic pressure wave is recorded on inspiration; the initial positive deflection reflects rising intraabdominal pressure, and the following negative phase is the supradiaphragmatic or intrapleural pressure as the hiatus slips downwards beyond the end of the catheter. By repeating this experiment with the catheter tip at varying levels the inspiratory range of hiatal movement can be determined; Marchand found it to average two centimetres in normal subjects, which is less than the usually quoted figures for movement of the diaphragm itself.

The amount of "bulging" of a localized diaphragmatic weakness will be determined by the difference in pressure on either side of the diaphragm. Many factors influence this pressure differential. After confirming that intragastric pressure, except during peristalsis, accurately reflected intraperitoneal pressure, Marchand demonstrated the influence of posture and gravity; intragastric pressure increases from little above zero to between 20 and 30 centimetres of water in the change from the erect to the head-down (45°) position. During quiet respiration intrapleural pressure ranges from −5 to −10 centimetres of water and intragastric pressure from +2 to +10 centimetres. The pleuro-peritoneal pressure gradient thus ranges from 7 to 22 centimetres of water during an expiratory-inspiratory cycle. On maximum respiratory effort (it may be noted that this extreme ventilatory level is never reached on the most severe exercise in normal subjects) a pressure gradient of over 100 centimetres of water, or almost the amount of a normal blood pressure, may be present. During coughing, intrathoracic pressure may be far higher than this; but because both it and the intraperitoneal pressure become extremely high, the pressure gradient across the diaphragm is not nearly so high as on deep respiration. During the Valsalva manœuvre, or less technically speaking during straining at stool or shifting a weight, the increase in both intrapleural and intraabdominal pressures also leads to a smaller pressure gradient across the diaphragm than does deep breathing. On the other hand, abdominal corsets or belts increase intraperitoneal pressure more than intrapleural pressure and so increase the pressure gradient.

The relationship of these findings to the clinical features of œsophageal regurgitation is fairly clear; Marchand points out that a high pleuro-peritoneal pressure gradient can produce this symptom even when the gastro-œsophageal sphincter mechanism is normal. To explain fully the clinical features, however, it is necessary to consider the intrinsic factors influencing intragastric pressure, as well as those influencing intraabdominal pressure. Intragastric pressure is shown to rise in association with belching, vomiting, gastric distension and pyloric spasm, the common factor probably being an increase in gastric tone for one reason or another.

Combining all these observations, Marchand provides a reasonable explanation for the flatulent dyspepsia of a seemingly heterogeneous collection of people: the obese, the pregnant, the air swallower, the glutton, the person intolerant of certain foods or with an intraabdominal tumour, the subject of a duodenal ulcer or gall-bladder disease. For the ingenious explanation of the flatulent dyspepsia in young, newly married, well-muscled men, the original paper should be consulted.

Marchand concludes by reviewing the anatomy of hiatus hernia in relation to the physical factors which have been described. It may well be that the "stress which produces regurgitation starts the first change in a vicious cycle which results eventually in the development of a hiatus hernia".

[1] *Thorax*, 1957, 12: 189 (September).

INTEGRATING THE APPROACHES TO MENTAL DISEASE.

"INTEGRATING the Approaches to Mental Disease" is an apt caption for a book epitomizing the work of two recent conferences held under the auspices of the Committee on Public Health of the New York Academy of Medicine.[1] A team of 50 experts culled from America, Canada, Brazil

[1] "Integrating the Approaches to Mental Disease: Two Conferences Held under the Auspices of the Committee on Public Health of the New York Academy of Medicine", edited by H. D. Kruse, M.D.; 1957. New York: Paul B. Hoeber. 10¼" × 7", pp. 416. Price: $10.00.

and England, with differing viewpoints on the causation, pathogenesis and therapy of mental disease, was brought together in order to plan research in common. The first conference dealt with the four major approaches to mental disease—namely, the organic, the experimental psychological, the psychodynamic and the psycho-social. As all the viewpoints were not sufficiently aired, it was decided to have a second conference, run on similar but not identical lines. Four different teams, each representing one approach, held plenary sessions, and each outlined its own frame of reference, vocabulary and methodology. The conference closed with an attempt to design an interdisciplinary approach to research.

The editor, H. D. Kruse, has endeavoured to retain the conference atmosphere by quoting in detail question and answer, as in a *Hansard* report of a parliamentary debate. Participants are artfully led up garden pathways lined with their own cherished flowers, which are decapitated by opponents. Arguments are ingenious and often brilliant. In spite of the encouragement of straight shooting by the participants, there is a friendly atmosphere showing a sincere desire for collaboration.

Admittedly such a conference must have been profoundly stimulating to all concerned. The point and counterpoint of argument by leaders in their specialities is useful in a practical sense. It must, however, be admitted that words bereft of atmosphere and personality are an imperfect substitute. Only by close study can the reader capture the threads of gold in the long pages of print; but those whose business is research can profit by the labour involved.

It is clear that the pathways to research are beset with many obstacles. Whilst the lone researcher feels he has an important role, others take the view that the vastness of the problem calls for intense teamwork. Both points of view are argued by the participants. It is obvious that both the solitary worker and the team are indispensable. Often the former blazes the trail on which the latter will follow.

Teamwork is not a royal road to success. Often it fails, and in all cases there is need for careful planning and interpersonal harmony. As might be expected, the debaters have much to say of the difficulty in understanding the basic principles underlying the different approaches. An alien jargon can become a mumbo-jumbo to a co-worker; such a possibility calls for patience, perseverance and goodwill.

The arguments of the contestants are diverse and interesting. Space forbids more than a cursory glimpse. As illustrative of the experimental psychologists' approach may be cited the case of four students leaning against a wall. A lamb is brought in and runs away; another lamb runs and tries to wedge itself behind their legs. The second lamb is the twin of the first, and has been removed from its mother and bottle fed from birth. Again, the psychodynamist pleading for better preparation for interdisciplinary work encourages us to follow the example of Helmholtz. He learnt the calculus at the age of 50 years, and two years later wrote highly original equations in electronics. Yet again, the psychologist who points out that the amount of stress varies in different cultures. To some the advent of an illegitimate child is just "ignorance and bad luck" without heartbreaks. There is also the quip concerning the tendency of some specialists to take major credit for their work in a complicated field. Reference is made to a sports writer who wrote: "Carresquel's homer won the game. He knocked in two runs in the first inning, and the game was 17 to 16, after twelve innings!" Still another example is the plea for a psychological approach involving even the worker on a gastric fistula, whose work was falsified because the patient, a girl, was stimulated by his presence and libidinized the opening. We are also reminded of the need for an open mind, as most of us (researchers included) are infantile; we like to repeat the same ritual, just as babies want the story told the same way rather than try a new tack. Yet again, we have the example of the organist stressing the importance of his approach by citing a strain of mice placed in a tub—95% went into androgenic seizures when a bell was rung. Finally, there is the remark of Freud concerning a contention that psychoanalysis is not a science because its bases cannot be probed by experiment. He replied with the question: As astronomers cannot experiment with stars, is astronomy a science?

Although no tangible discoveries were made, the proceedings concluded on an optimistic note. Difficulties can be overcome, and conferences are excellent catalysts of cross knowledge.

HEALTH PROTECTION FOR AIR TRAVELLERS.

THE number of air travellers on scheduled flights throughout the world has increased from 2,500,000 in 1937 to 90,000,000 in 1957, and is expected to surpass the 100,000,000 mark this year. This tremendous growth and the fact that aircraft are now being built to carry up to a hundred passengers, three or four times as many as a decade or two ago, may soon overtax the facilities at many international airports, not the least with regard to sanitary conditions, according to the WHO Expert Committee on Sanitation of International Airports, which held its first meeting recently in Geneva. Information supplied by WHO indicates that, in regard to airports, the International Sanitary Regulations, as set up by WHO, refer expressly to the quarantinable diseases, such as smallpox, cholera and yellow fever, and deal with safe water supplies, disposal of waste, and the control of insects, rats and other disease carriers. However, WHO has also recommended improving sanitation measures at international airports for the control of other diseases carried by food and water or by insects, and this was the main problem studied by the Expert Committee.

It is further pointed out that although air passengers must be given the best possible hygienic protection, the Committee recognized the fact that the health of crew members is even more important for safety in flight. It is difficult to replace crews *en route*; and if their health is not protected by all possible means, particularly in regard to illness with sudden onset, such as food poisoning and dysentery, not only does the risk arise of delays in flight, but also of emergency landings and, consequently, of hazards to the passengers. As one approach to these problems, the Committee has recommended the publication of an international manual on airport sanitation, including a guide to sources from which specialized information on the subject, dealing with all branches of international aviation, can be obtained. The proposed manual would give recommendations on how to provide, on a world-wide basis, safe drinking water and food, and good rest facilities to maintain the efficiency of crews and the comfort of passengers on international flights, and during "stop-overs" at airports. It would also give up-to-date information on how to solve the tricky problems of controlling carriers of disease at airports, such as insects and rats. Not only can they carry communicable diseases, but they can also cause food poisoning and represent, therefore, an immediate danger to crews and passengers. It appears that only very rarely do rats get on board aircraft; but if they do, they can gnaw through aluminium and puncture plastic tubing in frantic search for food and water, and they have been known to gnaw through wires on aircraft. There is plenty of justification for going to great trouble and expense to keep them out of airports and aircraft. However, it is not an easy task, for rats can jump two feet vertically, burrow two feet into the ground, climb smooth pipes up to three inches in diameter, and travel along horizontal wires. The necessity for a very thorough search for rat nests can be seen from the fact that nesting rats have been found in hollow runway markers.

Problems associated with the major quarantinable diseases and their transmission seem remote from Australia, but they should never be forgotten. Air communications provide one potentially weak link in the chain of controls. The other main one is the unnecessary susceptibility of our population to such entirely preventible diseases as smallpox.

Abstracts from Medical Literature.

DERMATOLOGY.

Basal-Cell Epitheliomata of the Sole.

I. Zugerman (*Arch. Dermat.*, August, 1957) states that basal-cell epitheliomata on the sole are rare. Pascher and Sims found no mention of palmar or plantar lesions in their review of the literature. Two patients with basal-celled epitheliomata of the sole came to the author's attention in a relatively short space of time and their cases are reported. One was a woman of 62 years who complained of a painful growth on the ball of the left foot, which had been present for eight years. The other was a man who underwent a surgical excision of a benign-looking, skin-coloured, painless fleshy growth on the plantar surface of the longitudinal arch of the foot. Histopathological examination showed basal-cell carcinoma in each case.

Relaxin in the Treatment of Scleroderma.

G. G. Caster and R. J. Boucek (*J.A.M.A.*, January 25, 1958) state that scleroderma is a generalized disease of connective tissue characterized by a loss of ground substance and an increase of the amount of collagen. There is a loss of elasticity, thinning and atrophy of the epidermis. Involvement of the parenchymal organs results in the replacement of parenchymal tissue by collagen. Scleroderma is a chronic disease of unknown origin characterized by remissions and relapses. No consistently successful therapy has been reported in its management. Relaxin has been prepared from an extract of the ovaries of pregnant sows. It also has been isolated from rabbit placentæ and from *corpora lutea* of sows. During studies of the effects of certain hormones on connective tissue in the rat, it became apparent that relaxin increased the elasticity of the skin *in vivo*. The possibility of the use of relaxin in patients suffering from loss of cutaneous elasticity, i.e. scleroderma, was thus suggested. Since December, 1954, the hormone relaxin has been used in the treatment of 23 patients with scleroderma. Relaxin in a saline solution or in a slowly absorbed gelatin base was obtained in a multiple-injection ampoule for parenteral use. The hormone was administered subcutaneously or intramuscularly. Depending on batch potency, each millilitre of relaxin contained from 10 to 20 milligrammes of active material. All patients received 1·25 milligrammes of conjugated œstrogenic substances ("Premarin") for two weeks prior to, or simultaneously with, the institution of relaxin therapy. Saline solution of relaxin was given in amounts of 20 milligrammes twice a day for one to two weeks and then the gelatin preparation was substituted in amounts of approximately 10 milligrammes given daily by intramuscular injection. Beneficial effects were not noted until the patient had been receiving treatment for three to five weeks. Parenteral injection of relaxin has been used for periods of from six to 30 months in the treatment of 23 patients with scleroderma. Significant reduction in skin tightness, Raynaud's phenomenon and trophic ulceration has been observed as a result of the administration of relaxin, representing a significant advance in the therapy of this disease. Other manifestations are unaltered by relaxin treatment.

Thyroid-Iodide Therapy of Blastomycosis.

T. Cornbleet (*Arch. Dermat.*, November, 1957) reports that thyroid and iodide were administered to nine patients with blastomycosis. Seven had cutaneous and two had systemic types of infection. All were clinically cured. The rationale of this treatment and basic considerations of the pharmacology and physiology of the thyroid gland, of its hormones and of iodine are discussed.

Granulomata Caused by Deodorants.

T. S. Saunders (*Arch. Dermat.*, November, 1957) reports an unusual eruption occurring in the axillæ of four patients after the use of certain deodorants. The eruption consisted of numerous small (1·0 to 4·0 millimetres) dusky reddish-brown papules closely set in the dome of the axilla but more discrete at the periphery. Itching was mild. In six months the lesions slowly flattened, but considerable hyperpigmentation remained. Histopathological examination revealed a characteristic granuloma suggesting a tuberculoid reaction. Three of the original four patients had used a stick-type deodorant containing zirconium. The fourth used a lotion-type deodorant containing chlorhydroxy-aluminium sulphate but no zirconium.

Pitted Scars.

A. S. Spangler (*Arch. Dermat.*, December, 1957) describes a new treatment for pitted scars. The area of the scar is anæsthetized with procaine; the fibrous strands beneath the scar are cut by the insertion of a small knife (a triangular two-edged Bowman iris needle) through the opening made by the gauge 20 needle used for the injection of procaine; a suspension of fibrin foam is injected into the space so created. Satisfactory results have been obtained in the treatment of 253 scars. Much longer periods of observation will be necessary to determine whether improvement will be permanent.

Multiple Hæmangiopericytoma.

T. S. Saunders and T. B. Fitzpatrick (*Arch. Dermat.*, December, 1957) discuss multiple hæmangiopericytomata and their distinction from glomangiomata (glomus tumours). The differential diagnosis of blue or red-blue sub-epidermal nodules includes blue nævus, metastatic melanoma, Kaposi's sarcoma and glomangioma. The authors wish to call attention to the hæmangiopericytoma, which may appear as a blue nodule clinically resembling a glomangioma. However, the histological pattern and prognosis are quite distinctive. One reason for attempting to distinguish the tumour of the glomus body from hæmangiopericytoma is the difference in prognosis. While hæmangiopericytomata have generally followed a benign course, there have been well-documented cases of malignancy resulting in death. There are no reports of a malignant glomangioma.

Fungous Infections of the Skin Treated with Pyrrobutamine Compounds.

A. L. Weiner and J. Schwarz (*Arch. Dermat.*, December, 1957) report that in the past several years they have attempted to evaluate the clinical effect of pyrrobutamine and of combinations of pyrrobutamine, undecylenic acid and several salts of this substance in the treatment of various superficial dermatomycoses. Pyrrobutamine, sodium undecylenate and combinations of these agents exhibit marked in-vitro fungistatic activity against several species of common dermatophytes. Their effect is greater than that of undecylenic acid, and two strains of *Trichophyton rubrum* were more sensitive to these agents than other common dermatophytes. Various preparations for topical use containing pyrrobutamine and combinations of pyrrobutamine, undecylenic acid, and sodium undecylenate appear to be effective in the therapy of superficial mycotic infections of the skin. This is particularly true with some *T. rubrum* infections previously resistant to treatment with other antifungal agents.

Neurodermatitis and Emotional Tension.

S. Rush, M. A. Storkan and M. E, Obermayer (*Arch. Dermat.*, December. 1957) report that five adult patients with chronic disseminated neurodermatitis were studied as a group by a psychologist and a dermatologist together, at meetings twice a week for a period of two years. Intense emotional interaction between patients afforded ready direct observation of emotional and cutaneous changes in each patient. Conversations among the patients during the group sessions were recorded on tape and correlated with the simultaneous clinical observations. Samples of the material collected and graphs depicting individual fluctuations in emotional tension and in the dermatitis are presented and discussed. Their data support the hypothesis that exacerbations of neurodermatitis are precipitated by emotional tension, as defined in the report, and that decrease of inflammation occurs when tension is relieved. Severe stress to the personality and skin during infancy may be the background of this anxiety-laden attention and possibly of cutaneous localized stress reactions. The patient with neurodermatitis reacts to certain situations both emotionally and somatically in the primitive fashion of infancy.

Treatment of Eczema Herpeticum with Gamma Globulin.

J. P. Ruppe, E. F. Wilson and W. Wolins (*Arch. Dermat.*, November, 1957) state that *eczema herpeticum* is characterized by poorly grouped umbilicated vesicular lesions containing

clear serum which occurs initially in the eczematous skin. The onset is very acute, accompanied by high fever and malaise, and other lesions may appear later on previously healthy skin. Barrow notes that the lesions of *eczema herpeticum* were often greater in number, more uniform in size and more widespread in distribution than those in *eczema vaccinatum*; whereas in *eczema vaccinatum* the crusts were more adherent, the associated lymphadenopathy was more marked and there was a history of vaccination or recent contact with someone who had been vaccinated. The authors report a case of a patient who seemed to respond dramatically to gamma globulin. A seventeen-year-old girl is reported who had *eczema herpeticum* with severe systemic effects which subsided promptly after she received 24 millilitres of gamma globulin given by intramuscular injection.

UROLOGY.

Tuberculosis of Prostate and Seminal Vesicles.

A. SPORER AND G. OPPENHEIMER (*J. Urol.*, September, 1957) review the medical and surgical treatment of prostatic tuberculosis in the prechemotherapy era, and contrast it with what has happened since then; they also give reports of two fairly recent cases. Inasmuch as early observations indicated that tuberculosis heals with fibrosis, earlier medical therapy was directed to the promotion of fibrosis around the tuberculous area. In the urinary tract generally when conservative measures failed, or an obstructive uropathy developed, open operation was tried. Unfortunately, in the case of the prostate and vesicles, the technical difficulties of excision presented virtually insurmountable problems. Mortality was by no means low, and complications such as urinary incontinence and fistulæ were all too common. The introduction of anti-tuberculosis drugs has completely changed the outlook. However, the modes of action of streptomycin, para-amino-salicylic acid and isoniazid are not properly known. Isoniazid, which can penetrate even caseous lesions, is thought to act by competitive interference with an essential metabolite of the bacterium. PAS probably interferes with the oxygen consumption of the tubercle bacillus, and thereby inhibits its growth. It has been observed that after the onset of chemotherapy there is perifocal clearing. This prevents the fibrosis which used to be the aim of earlier therapy. Prevention of fibrosis in healing is more marked with isoniazid, with which increased vascularity occurs. The tuberculous area is rather avascular and streptomycin used alone will not diminish fibrosis. The natural resistance of the host increases the efficacy of medication, hence the importance of rest and prolonged sanatorium treatment. The immediate effect of chemotherapy in severe genital tuberculosis is the abatement of toxic symptoms such as pyrexia, which usually descends to normal within 10 to 14 days. However, the healing of lesions is slow, even though clinical improvement may be impressive. Out of 25 patients with prostatic tuberculosis so treated, 23 have become symptomless and have remained so, but there is no proof that some living bacilli are not still present within walled-off areas. If caseation is progressive, or if obstructive uropathy occurs (e.g. in the kidney and ureter) operation may become necessary in an occasional case. The authors recommend that chemotherapy should be maintained for at least 12 to 18 months, all three drugs being used preferably simultaneously. They recommend at least six months' sexual abstinence and consider that for the first six months it is an advantage to keep the patient in bed.

Ileal Bladder Substitution.

J. J. CORDONNIER (*J. Urol.*, May, 1957) has reviewed 78 cases of ileal bladder substitution performed over a period of three and a half years. The various early and late complications are discussed. There were no complications in 48 cases. The commonest single complications were: wound dehiscence, six cases; pyelonephritis, four cases; electrolyte disturbances, three cases; uræmia, three cases; ileus, three cases. It is claimed that the principal advantages over ileocolonic anastomosis are (i) almost complete absence of hyperchloræmic acidosis; (ii) very reduced incidence of urinary sepsis; and (iii) a greater freedom for transplantation of dilated ureters. In 37 cases, implantation of the ureters into an isolated ileal loop was performed for carcinoma of the bladder, together with total cystectomy. In 15 cases palliative diversion without cystectomy was done. In four cases it was done for revision of uretero-sigmoidostomy because of progressive loss of renal function. In seven cases it was done because of bilateral scarring of the ureters after irradiation for carcinoma of the cervix. Finally, in 18 cases it was done because of various types of non-malignant diseases (including the results of trauma). In addition to the early complications, some of which have been listed above, there were various late complications such as recurrent carcinoma, tight stoma on the skin, late pyelonephritis, progressive hydronephrosis, sensitivity to the skin-bag and anæmia. Even in the light of the long lists of early and late complications, the author considers implantation of the ureters into an isolated loop of ileum a satisfactory means of urinary diversion.

Senile Urethritis in Women.

V. H. YOUNGBLOOD, E. M. TOMLIN AND J. B. DAVIS (*J. Urol.*, August, 1957) state that senile arthritis in women is an atrophic lesion due to a deficiency of endogenous ovarian hormone, and is manifested by irritative symptoms of the lower part of the urinary tract. There is very little recognition of this lesion in the literature. Analysis of the records of some 1200 cases showed that before the menopause women were almost invariably relieved by using "Furacin" (nitrofurazone) suppositories in the urethral canal, but a high percentage of older (postmenopausal) subjects were not. However, the addition of 0·1 milligramme of diethylstilbœstrol to each suppository of "Furacin" caused relief of symptoms in all members of this group. Endoscopy reveals that the urethral mucosa is atrophic, inelastic, hyperæmic and bleeds easily. In further studies it was found that these suppositories containing œstrogen as well as "Furacin" were effective in both chronic non-specific and senile urethritis in women. In most cases any associated senile vaginitis was also relieved.

Carcinoma of the Deep Male Urethra.

V. F. MARSHALL (*J. Urol.*, September, 1957) claims that radical excision may offer great benefit to the man with a locally extensive carcinoma originating in the deep urethra. Even the presence of metastases in a node or two does not invariably indicate that the case is hopeless. More than 230 cases of carcinoma of the male urethra have been reported, and nearly two-thirds of them seem to have originated in the deep part of the canal. The records in the author's clinics in New York show that in 22 years (1933 to 1955) eight cases of deep urethral carcinoma were seen. The therapy of these growths has varied greatly, but radiation has generally been unsatisfactory. Of this series, only the last five were subjected to truly radical surgery. The first three patients, under palliative treatment, did not do well; all died, or were soon to die. In the more radical approach, the simpler method of excising the whole of the affected urethra with the prostate and establishing a permanent cystostomy did not fulfil expectations; it was found to be necessary to do a complete prostato-cystectomy, with transplantation of the ureters. In the last five cases, with such truly radical treatment, there has been only one death. This occurred early (two months after operation) and was due to urinary tract sepsis, no trace of carcinoma being present on autopsy, either at the primary site or in lymph nodes. The more potent antimicrobial drugs available today might have prevented this death. The other four patients have survived from six to 15 years.

Bladder Neck Obstruction in Children.

E. BURNS, E. H. RAY AND J. W. MORGAN (*J. Urol.*, May, 1957) state that obstructive lesions in the region of the bladder neck are common in children. They are congenital and are often associated with other abnormalities. The most common lesion is hypertrophy of the internal vesical sphincter. Less often, valves in the posterior part of the urethra and hypertrophy of the verumontanum are found. The clinical manifestations vary considerably. The commonest finding is pyuria. Other manifestations are frequency and straining to urinate, urgency, enuresis, overflow incontinence, acute retention and hæmaturia. Removal of the obstruction may be accomplished either by endoscopic resection, or by open transvesical approach; in the younger age group the authors prefer the open approach.

British Medical Association.

NEW SOUTH WALES BRANCH: SCIENTIFIC.

A meeting of the New South Wales Branch of the British Medical Association was held on December 12, 1957, at the Robert H. Todd Assembly Hall, British Medical Association House, 135 Macquarie Street, Sydney, Dr. G. L. Howe, the President, in the chair.

Pruritus.

Dr. S. D. Meares read a paper on "Pruritus Vulvæ" which has not been made available for publication.

Dr. E. Wilson then read a paper entitled "Pruritus Ani: A Prosaic Problem" (see page 558).

Dr. B. H. Peterson, in opening the discussion, first considered the functions of the skin. He said that they were many, but those of special interest to the psychiatrist were as an expression of emotion and self-display. With the eyes and the musculature of the face the skin was the chief organ of emotional expression through the autonomic nervous system, various feelings being portrayed by alterations in the tone of the cutaneous blood vessels—for example, the blush of shame, the pallor of fear; by sweating—for example, anxiety and fear; by erection of hairs—for example, fear produced by "hair-raising" stories. Itching could be a sign of impatience; for example, even a chairman might be itching to terminate a discussion and go home to bed. There was thus no doubt about the powerful influence of emotions on the skin, and it was not hard to understand why emotional stress often caused exacerbations of skin disorders including *pruritus vulvæ* and *pruritus ani*. The skin's function in self-display was easy to observe on the beaches at the present time of the year. Dr. Peterson went on to say that in "Blakiston's New Gould Medical Dictionary", itching (pruritus) was defined as an "uncomfortable sensation due to irritation of a peripheral sensory nerve". The word uncomfortable needed to be qualified somewhat; there was an erotic pleasurable sensation in scratching an itch, and that particularly applied to the vulva and the anus. The words "irritation of a peripheral sensory nerve" also needed qualification, because itching could be purely psychic and independent of stimulation of peripheral end organs; for example, one could anæsthetize a finger by local infiltration, and then under hypnosis suggest to the subject that the finger was itching. What nerve endings were involved? Probably those connected with touch and pain. There was a close relationship between pain and itching. Possibly the irritation was brought about by histamine. It was important to remember that in pruritus a vicious circle was easily set up. The cause of the itch might originally be organic—for example, trichomonas vaginitis. That produced scratching of the vulva with lichenification, which itself led to itching, and the itching might serve an erotic gratification; it might in fact be a masturbatory equivalent and produce relief of emotional tension. Another point was that the itch threshold was reduced in emotional stress (that had been shown experimentally), and in neurotic patients, especially of anxious, obsessional types—for example, the fussy, over-conscientious worriers. Most dermatologists stressed the fact that pruritus was apt to be most severe and intractable in neurotic patients. Vulval, scrotal or anal pruritus might be accompanied by hyperidrosis. Dr. Peterson went on to say that in some cases of *pruritus vulvæ*, as had already been mentioned, the itching might serve an erotic need. The patient might be a chronic masturbator, or there might be frustration or incomplete satisfaction in heterosexual relationships. Scratching then came to provide a satisfaction which the patient could not achieve or felt forbidden to achieve by clitoral or vaginal self-stimulation or by sexual intercourse. In a heterosexual relationship, that might be due to sexual maladjustment in the patient or in her partner, who was unable or unwilling to satisfy her. In a few cases there seemed to be a self-punishing masochistic element in the scratching, and it might be found that guilt over masturbation or illicit liaisons was present. In other cases there was fear of pregnancy or venereal disease or cancer.

Dr. Peterson then said that in some cases of *pruritus ani*, especially those in which the condition was unresponsive to purely somatic therapy and in which lichenification was severe, there might be inadequately expressed rage or aggression or passive homosexual tendencies (overt, conscious or unconscious).

Referring to treatment, Dr. Peterson said that ideally, in cases in which emotional factors were present, somatic and psychological treatment should go hand in hand and might assist each other. Many of the emotional problems were relatively simple and superficial (accessible to ordinary inquiry in an interview), and if the general practitioner, surgeon, gynæcologist or dermatologist had the interest, patience, kindliness and, above all, time to listen, ventilation by the patient of his or her feelings and problems and some readjustment of attitudes and environmental factors might be all that was required, along with somatic treatment, to give relief or effect a cure. However, the clinician would often have to be willing to persevere over a long period of time; people did not easily give up old attitudes and habits. Sedation, of course, at night had its place in breaking vicious circles of itching, scratching and insomnia. "Sodium Amytal" was probably the most useful drug. In more long-standing and severe cases, and especially in those in which obvious psychoneuroses were present, the clinician might consider referring the sufferer for psychiatric help. Those, of course, were the very patients whom it was hardest to help as had already been indicated, since in many cases, especially *pruritus ani*, there was an obsessional personality or obsessional neurosis. Whereas many obsessional patients could be helped to adjust themselves to their temperament and obsessions, few could be radically altered or cured; hence psychiatrists became frustrated and developed an obsession about obsessionals. Dr. Peterson said that he must not paint too gloomy a picture. There were, especially in the younger age groups, some patients with ano-genital pruritus who had sufficient intelligence and flexibility to be helped by superficial or deep psychotherapy, which might or might not include hypnosis as one of its tools. Shorvon and others reported that abreactive treatment could help some, mainly relatively stable personalities with hysterical and anxiety symptoms who had broken down under severe stress. The most successful abreative agent in those cases was ether or "Methedrine" (15 to 30 milligrammes). They might help the patient to recall an earlier traumatic incident (for example, a homosexual assault in cases of *pruritus ani*), the memory of which he had repressed, and which under the drug he could relive with full emotional expression and release of tension.

Dr. E. J. C. Molesworth said that the dermatologist saw a totally different group of patients from those seen by the gynæcologist and surgeon, the majority having no physical basis for the disorder. He had been particularly impressed by the excellent photographs shown by Dr. Meares, as he dealt with the differential diagnosis. Dr. Molesworth said that he supported the speaker's disagreement with the use of antihistamines. The application of kerosene, to which reference had been made, was quite a common event in *pruritus ani*. Dr. Molesworth agreed that *lichen sclerosus* was a premalignant condition, and that a patient should be kept under strict observation. He heartily agreed that X rays should not be used on the vulva; their use did no permanent good except to the dermatologist's pocket. It was important to realize that relief of symptoms was not a cure and that on relapse the patient often went to the next doctor in his orbit.

Dr. C. V. Salisbury said that several years earlier he had carried out an investigation at St. Vincent's Hospital on all patients who had complained of *pruritus vulvæ*. In over 90% of those cases a definite cause for the condition was discovered. Trichomonas infection and thrush accounted for 70%, deficiency states, including achlorhydria, vitamin deficiency and anæmia (both hyperchromic and hypochromic) accounted for another 20%, and the remaining 10% were caused by such conditions as leukoplakia and *diabetes mellitus*. The role of psychosomatic factors was very small indeed. Dr. Salisbury did not agree with Dr. Meares's statement that such conditions as carcinoma of the vulva or cervix, fistulæ, hæmorrhoids or *kraurosis vulvæ* ever caused itch. Frequently those conditions did cause pain and discomfort, but never itch. He said that he considered the simplest practical method of dealing with vulval itch of unknown origin was to treat the condition as if it was a trichomonas infection. If there was not a quick response to that treatment, a complete investigation should then be carried out to find the cause.

Dr. G. L. Howe spoke from the general practitioner's point of view. He said that the general practitioner saw such patients first, and every general practitioner would agree that many cases were due to trichomonas infection and that many more were due to monilia. That was often the result of antibiotic medication, particularly the use of one of the "mycin" antibiotics. In his experience the first thing had been to exclude the possibility of threadworms. Thread-

worms were the cause in 80% of the cases in the hands of general practitioners. Patients usually responded to treatment; however, their treatment required a great deal of patience.

Dr. S. D. Meares, in reply, first referred to what Dr. Peterson had said about the psychosomatic aspects of the condition. Dr. Meares said that once or twice he had encountered a case in which a girl who was about to be married put off the wedding on several occasions because she had pruritus. The treatment was to fix the wedding date, then cure the pruritus. Dr. Meares agreed with Dr. Molesworth that *lichen planus* was a premalignant condition. Not many dermatologists would admit that. Dr. Molesworth was quite right in what he had said about not using X rays on the vulva. The treatment in *pruritus vulvæ* was not so much a no-man's-land as a place for combined operations. The best results were obtained with the help of the surgeon, the psychiatrist, the dermatologist and the gynæcologist. Dr. Meares said that he thought Dr. Molesworth and Dr. Salisbury were talking about completely different subjects. Dr. Salisbury was talking about patients with discharge who had pruritus also. Dr. Molesworth was talking about patients with pruritus and no discharge. Dr. Meares disagreed with what Dr. Salisbury had said about carcinoma, Bowen's disease and basal-cell carcinoma being associated with pain rather than with pruritus. In more than 80% of cases those conditions were associated with pruritus. Pain was due to the presence of infection.

Dr. T. E. Wilson, in reply, said that he thought that Dr. Peterson had misunderstood him. He had not said that there were no psychiatric or emotional problems in affected patients. Some had quite a lot, and sometimes they increased as the disease progressed. Those were the few patients who were sent to the psychiatrist. Perhaps they should send a large number of the patients to the psychiatrist to start with, and the psychiatrist could return the ones they could not cure. Dr. Wilson said that he could not quite agree with Dr. Molesworth; most patients with pruritus did not consult him requiring operations. They consulted him to have their pruritus cured, because he had performed an operation such as hæmorrhoidectomy on their neighbour and effected a cure. Quite a high percentage of patients with pruritus had no obvious cause for their condition. Dr. Wilson agreed that X rays should not be applied to the perianal region. The reason was that those patients who were given X-ray treatment were very pleased with it at the first attempt. They obtained relief, and then after a few weeks the relief passed off and they asked for more X-ray treatment. From then on they were in trouble if it was repeated. He agreed that threadworms were a frequent cause of *pruritus ani*. However, even if piperazine or one of the newer medicines against threadworms was used, there was a large percentage of recurrences. He carried out a sigmoidoscopic examination as a routine and had found that that was useful in making the diagnosis of threadworms.

VICTORIAN BRANCH: SCIENTIFIC.

A MEETING of the Victorian Branch of the British Medical Association was held, by invitation of the Cancer Institute Board, at the Peter MacCallum Clinic, 483 Little Lonsdale Street, Melbourne, on November 28, 1957. The meeting took the form of a series of demonstrations by members of the staff of the clinic.

The Place of Post-Operative Irradiation in Breast Cancer.

DR. BASIL A. STOLL discussed the place of post-operative irradiation in the treatment of breast cancer. He said that post-operative irradiation was not given in the case of stage I outer quadrant tumours, but was given to the internal mammary, axillary and supraclavicular node areas in the case of inner quadrant tumours. It was given also to the same areas when the axillary nodes were found involved at operation. Pre-operative irradiation was sometimes advisable in late stage II cases—"borderline operable" cases in which there was a large but mobile primary growth, or multiple, large, high axillary nodes were present.

The Results of Hormone Therapy in Breast Cancer.

Dr. Stoll also gave a demonstration of the effects of hormone therapy in advanced breast carcinoma, after selection of hormone-sensitive subjects by castration or male hormone therapy. The sequence of cortisone administration, adrenalectomy and hypophysectomy was demonstrated. Dr Stoll said that female hormone therapy was used only for the older patient or in hormone-resistant cases. The use of urinary calcium excretion, serum calcium level and serum alkaline phosphatase level for establishing objective criteria in the treatment of metastatic breast cancer in bone was stressed. A fall in urinary calcium excretion was not always accompanied by clinical improvement because of the calcium-retaining properties of some hormones, particularly the androgens. Persistence with measurements for three weeks was necessary in some cases, in order to demonstrate the urinary calcium changes. The use of new androgen compounds for oral administration, "Fluoxymesterone" and "Sublings Testosterone", was evaluated, and the considerably decreased virilization associated with their use compared with that of testosterone propionate was mentioned.

The Place of Surgery in Breast Conditions.

MR. T. ACKLAND presented a series of cases of carcinoma of the breast to illustrate the viewpoint that the criteria for surgery should be stricter and narrower than they had been in the past. He said that any of a large number of clinical signs might indicate that a breast cancer was surgically incurable. Once that stage had been reached, the patient was best treated by radiotherapy alone. It was pointed out that the demonstration by McWhirter that simple mastectomy apparently was as successful as radical mastectomy was dependent upon the fact that surgically incurable patients had in fact been wrongly subjected to radical surgery.

Mr. Ackland also showed patients to illustrate the common cause of a blood-stained discharge from the nipple. He said that that was essentially a benign condition, due most frequently to a duct papilloma within a dilated duct near the nipple. A small curved subareolar incision enabled the involved duct to be identified and to be removed with a cone of breast tissue, which should always be handed at once to a pathologist. That last precaution was desirable, since a carcinoma might occasionally be present.

Finally, Mr. Ackland showed a patient to illustrate the use of "Z-plasty" in the incision for radical mastectomy. He said that although the favourable axillary scar which resulted from that procedure was helpful in preventing restricted mobility, early active movements by the patient were still of the greatest importance.

Serum Protein Changes in Malignant Disease.

DR. R. MOTTERAM and MR. I. PARSONS discussed serum protein changes in malignant disease. They demonstrated several examples of multiple myeloma serum and urine with abnormal protein components by paper electrophoresis. They also discussed a case of macroglobulinæmia diagnosed by ultracentrifuge analysis. It was pointed out that patients with untreated Hodgkin's disease invariably showed a raised alpha-2 globulin level, which was roughly proportional to the activity of the disease process. Some electrophoretic patterns were shown which supported those findings. It was stated that those patients with a much increased gamma globulin usually had a better prognosis. Treatment might alter those serum protein changes.

Demonstration of Leucocyte Phosphatases.

Dr. Motteram and Mr. Parsons then gave a demonstration of leucocyte phosphatases. It was stated that quantitative measurement of leucocyte alkaline phosphatase had proved useful in differentiating chronic myeloid leuchæmia from the leuchæmoid blood picture sometimes seen in the myeloproliferative phase of *polycythæmia vera* and myelofibrosis. In chronic myeloid leuchæmia there was an extremely low level of that cell enzyme as opposed to very high levels in *polycythæmia vera*. The levels were also raised as a natural response to bacterial infection. Relative and compensatory polycythæmia might also be differentiated from *polycythæmia vera* by that method. Qualitative examination of blood smears stained histochemically for alkaline phosphatase was useful as a screening method.

Radioactive Iron and Chromium Studies.

Dr. Motteram and Mr. Parsons finally gave a demonstration showing the use of radioactive iron and chromium in hæmatological practice. It was stated that Fe^{59}, after intravenous injection, was quickly cleared from the plasma, mainly by the bone marrow. The appearance of Fe^{59} in the red cells was followed by the taking of blood samples on succeeding days. Fe^{59} emitted penetrating gamma irradiation, and surface counting over sacral marrow, spleen and

liver gave the distribution of the isotope in those organs at any stage in the test.

Typical variations in the pattern of plasma clearance, red-cell utilization and surface counts were shown in *polycythæmia vera*, hæmochromatosis, myelofibrosis and various stages of Hodgkin's disease.

Radioactive chromium (Cr^{51}) was used to tag red cells *in vitro*. They were reinjected, and their survival *in vivo* was estimated by the taking of samples at suitable intervals.

Shortening of red-cell life in Hodgkin's disease was shown to be proportional to the stage and activity of the disease.

The response to cortisone therapy of an acquired hæmolytic anæmia associated with chronic lymphatic leuchæmia was shown by return of the red-cell survival to normal.

Radio-Surgical Treatment of Uterine Cancer.

MR. G. GODFREY and DR. G. R. KURRLE demonstrated the radio-surgical management of uterine cancer. It was stated that the policy at the Peter MacCallum Clinic and the Royal Women's Hospital was radical radiotherapy followed by radical surgery in most cases. Charts were shown setting out that policy, and the programme usually carried out in individual cases. Alternative methods were also depicted. Details of radiotherapy techniques used and various special applications were also displayed.

The anatomical basis for the irradiation techniques was illustrated by dissected specimens, while the dosage distribution in various planes was shown on a "Perspex" model of a typical grouping of radon sources.

The results of irradiation as found at operation with regard to residual primary disease and glandular metastases were also shown, as well as five-year survival curves achieved by the combined treatment.

Malignant Disease of the Throat and Mouth.

MR. E. E. DUNLOP showed a series of patients to illustrate problems encountered in the mouth and throat clinic, and to demonstrate early and late results of treatment.

In tumours of the tongue and the floor of the mouth, some excellent cosmetic and functional results illustrated the standard practice of radiotherapy to the primary growth and block dissection of lymph nodes. A patient who had had an extensive recurrence in the tongue and the floor of the mouth following radiotherapy was shown, after successful hemiglossectomy, hemimandibulectomy and block dissection of lymph nodes on that side. Representatives of a controlled series of cases were shown in which patients presenting with obvious cervical glandular metastases had been treated by surgery to the primary lesion in continuity with radical block dissection of the neck.

Mr. Dunlop then discussed cancer of the larynx, and showed three patients to illustrate laryngectomy with block dissection on the appropriate side. In one case, laryngectomy had been carried out approximately four years earlier for a giant-celled sarcoma of the larynx. Satisfactory pharyngeal speech was demonstrated, and the comfort achieved by tracheal openings not requiring indwelling tubes was stressed.

Four patients with cancer of the pharynx were shown, to indicate the place of surgery, particularly in radio-resistant cancers of the lower part of the laryngo-pharynx.

The first patient was a man who had had a carcinoma of the upper part of the laryngo-pharynx, treated by pharyngo-laryngectomy and block dissection with primary reconstruction. He enjoyed good health in the fourth year after operation.

The second patient was a woman in her seventy-sixth year, who was in good health five years after pharyngo-œsophago-laryngectomy and replacement by a plastic tube with a split skin graft. The tube was still *in situ*.

The third patient was a woman with extensive post-cricoid cancer, who had been treated by pharyngo-œsophago-laryngectomy and staged reconstruction with a full-thickness skin graft.

The fourth patient was a woman with extensive recurrent carcinoma of salivary gland origin, involving the palate and the naso-pharynx, treated by surgical excision and a split skin graft on dental "Stent".

Mr. Dunlop finally showed a male patient with carcinoma of the cervical part of the œsophagus, to illustrate treatment by surgical excision with conservation of the larynx and replacement with a grafted tube. The patient was swallowing well two weeks after operation.

Reticuloses.

DR. J. MADIGAN presented the work being done in the reticuloses clinic. He said that an analysis had been made of almost 400 cases of leuchæmia and lymphoma dealt with at the clinic during the period January, 1950, to June, 1956. The lymphomata had been classified into the following groups: (i) Follicular lymphoma. (ii) Lymphosarcoma: (*a*) lymphocytic, (*b*) lymphoblastic. (iii) Hodgkin's disease: (*a*) grade I, (*b*) grade II, (*c*) grade III. (iv) Reticulosarcoma.

Dr. Madigan said that the analysis had produced a number of findings of interest. (i) Additional survival was obtained in chronic myeloid leuchæmia by using "Myleran" for patients not responding to X-ray therapy to the spleen. (ii) The use of chemotherapeutic agents failed to improve survival in chronic lymphatic leuchæmia to any degree greater than the survival obtained from irradiation. (iii) The toxicity associated with chemotherapy in that group of conditions had been greater than from radiotherapy. (iv) Prognosis could be related to the pathological grading and clinical staging of lymphomata when a patient was first examined. (v) The present methods of treatment for reticulosarcoma were unsatisfactory, in that either radiotherapy or chemotherapy produced only 50% survivals at five months after treatment.

Patients were presented illustrating the cutaneous manifestations of the reticuloses, and a display of radiographs showed the response of mediastinal lymphomata to X-ray therapy.

Skin Tumours.

DR. C. C. MINTY, with DR. R. MOTTRAM and DR. S. WERF, gave a demonstration of skin tumours, which was divided into three sections.

In the first section patients were shown to illustrate the results of X-ray therapy to both squamous and basal-cell carcinoma of the head and neck. The first patient, aged 74 years, had had a small infiltrating squamous carcinoma of the left side of the lower lip; she had a slight scar only five months after treatment. The second patient, aged 41 years, had had a small superficial squamous carcinoma on the right side of the lower lip; it had healed with an invisible scar 12 months after treatment. The third patient, aged 56 years, had had a small basal-cell carcinoma of the right cheek for two years; it had healed with a slight scar 18 months after treatment. The fourth patient, aged 48 years, had had a medium-sized basal-cell carcinoma on the right temple for three months; the scar showed a little atrophy and loss of pigment at 18 months. The fifth patient, aged 58 years, had had a basal-cell carcinoma on the right temple for one year. A slight scar was barely visible at two and a half years. The sixth patient, aged 65 years, had had a moderate-sized basal-cell carcinoma in the left naso-labial fold for three years; the scar showed a little atrophy at four years. The seventh patient, aged 36 years, had had a medium-sized basal-cell carcinoma on the left inner canthus for seven months. An atrophic scar with telangiectases was present at eight years, associated with many telangiectases on untreated parts of the face and nose.

Five other patients in the first section were shown from the point of view of treatment. The first, aged 85 years, had multiple large basal-cell carcinomata on the abdominal wall, sacrum and scalp, present for many years. In some areas the results of treatment with radon moulds were seen, with atrophic scarring as a result of large areas being treated. Other lesions were being treated with radon, and the appliances were in position. The second patient, aged 37 years, had multiple basal-cell carcinomata, which had been treated for more than three years before she attended the clinic. At her first visit, eight small lesions were treated with X-ray therapy. Subsequently a basal-cell carcinoma on the back of the neck was excised. The comment was made that her case illustrated multiple skin cancer in a young person. That condition was treated by radiotherapy except when special indications for surgery arose. In the case of the lesion on the neck, the area would have been exposed to irritation from a collar, which might lead to breakdown of the irradiation scar. The next two patients illustrated the problem of residual malignant disease in deep tissues after inadequate treatment. The first, aged 76 years, had had a basal-cell carcinoma on the left temple 14 years previously; it had been treated with radiotherapy on several occasions over a period of seven years, and had then apparently healed. The scar had broken down 18 months previously, and a large tumour had formed 12 months later. The main mass of the tumour was deep in the temporal fossa and in the lateral part of the orbit. Although there had been apparent healing on the surface, the tumour

had been infiltrating deeply for many years and was considered incurable. It was decided to treat it with radiotherapy. The depth of infiltration necessitated the use of a special deep X-ray therapy technique, which was described. The result of treatment was the disappearance of the tumour, but it was considered that the result was palliative only, in that the original state was incurable and that there might be some tumour remaining. The second patient, aged 65 years, had had beta ray therapy for a basal-cell carcinoma at the corner of the right eye six years previously. It had recurred with a little superficial ulceration, but did not worry him. When he attended the clinic, a deeply infiltrating lesion was revealed on the medial aspect of the right upper eyelid, extending onto the inner canthus. There was a little atrophic scar from the previous treatment. It was considered that in its six years' growth, deep infiltration had taken place along the medial wall of the orbit. At the present stage the last chance of cure was offered, so that the decision as to the nature of the treatment required special consideration. It was thought that if radical radiotherapy was given and failed, no further radiotherapy or surgery could be offered even in a palliative role. Radical surgery at that stage offered perhaps a slightly greater chance of cure, and if it failed, residual malignant disease could be later treated with palliative radiotherapy. The final patient in the first section, aged 43 years, had a large lesion on her right upper lip, present for two weeks and growing rapidly, and a much smaller lesion on the right side of her forehead, present for three weeks. A similar lesion had been present on the right temple, but underwent spontaneous regression. The lesions showed the typical appearance of *molluscum sebaceum*. Methods of treatment of that condition were discussed.

The second section in the skin tumour demonstration was the showing of a series of 35 millimetre colour slides, illustrating types of patients seen in the skin clinic and methods of treatment. A large number of macroscopic and microscopic photographs demonstrated appearances of benign, pigmented nævus, warty nævus, infected benign nævus, junctional nævus, compound nævus, juvenile nævus and malignant melanoma. It was stated that the policy was to refrain from interfering with pigmented nævi which were typically benign, removing any suspicious lesions for microscopic examination of sections. Complete excision was carried out with adequate margin, and that became the definitive treatment should the lesion prove to have been malignant. The active junctional nævus was regarded as a non-infiltrating melano-carcinoma and treated by adequate excision of the primary lesion, the gland fields being kept under observation. When clinical and pathological features of infiltrating melano-carcinoma were present, adequate local excision was combined with lymph-node dissection on the same side. While the common route of dissemination was to regional lymph nodes, or by the blood-stream to lungs, liver and brain, bone metastases could occur. An X-ray examination of the skull in such a case was shown, the appearance closely resembling multiple myelomatosis. The other point emphasized was that in the presence of permeation of skin lymphatics (usually associated with obstruction of lymph drainage by lymph node metastases), even the most radical excision was almost invariably followed by local recurrence. In the case demonstrated, forequarter amputation and extensive skin graft to the thorax were associated with multiple skin nodules of melanoma.

Examples of radiotherapy for basal-cell and squamous-cell carcinoma were shown. The comment was made that pigmented basal-cell carcinoma might mimic clinically malignant melanoma, and *molluscum sebaceum* might resemble squamous carcinoma. An inadequate biopsy of a *molluscum sebaceum* might be indistinguishable from an infiltrating carcinoma. Among the rarer tumours shown were reticulum cell sarcoma of skin, glomus tumour and *mycosis fungoides*.

Two benign conditions which had to be distinguished from radio-sensitive malignant tumours were shown. The first was chronic nodular perichondritis of the ear. It was pointed out that the epithelium overlying the degenerated cartilage was often hyperplastic, and inadequate biopsy might lead to a diagnosis of squamous carcinoma. The other lesion shown was a dermato-fibroma of skin, which might show such cellular fibroblastic proliferation that a pathologist unfamiliar with the condition might well report the presence of a sarcoma.

Finally, a technical exhibit showed the various appliances and methods by which radiotherapy was carried out.

Primary Tumours of Bone.

MR. H. A. S. VAN DEN BRENK, DR. R. MOTTERAM and DR. S. WERE presented a series of 152 cases of primary tumours of bone, and demonstrated the clinical, pathological and radiological features. A modified classification was used, based on clinical features, histopathological diagnosis and radiological appearances, and designed to facilitate comparisons of survival and the results of treatment in that rare disease. Survival curves, constructed after the method of Berkson and Gage, were shown for each classified subgroup, together with a statistical analysis of the results of treatment by the radio-surgical routine adopted for the disease at the Peter MacCallum Clinic. The histopathological and radiological features and the clinical history of numerous cases belonging to each group were illustrated. Particular demonstrations included the radiological changes in different types of tumour following irradiation, the pathological grading of chondrosarcomata and osteoclastomata, the special topographical and pathological characteristics of the round cell-reticulum cell tumour groups and the late changes in bone following irradiation of osteoclastomata.

^{32}P Uptake in the Diagnosis of Cutaneous and Ocular Melanomata.

MR. K. H. CLARKE and MR. H. A. S. VAN DEN BRENK, in conjunction with DR. KELVIN LIDGETT (Eye and Ear Hospital, Melbourne), presented the preliminary results of an investigation, new to Australia, in the use of a small dose of radioactive phosphorus, given to a patient with a suspected melanoma, as an aid to diagnosis, and demonstrated the apparatus and technique.

The radio-biological factors determining the differential uptake of ^{32}P by malignant cells were demonstrated, together with errors in the interpretation of findings which might result. The importance of accurate physical determinations was stressed, and also the relation of beta-particle energy to range in tissues was demonstrated on pathological material obtained at operation.

Other aspects demonstrated included an evaluation of the radiation hazards to gonads of the technique under discussion (shown to be very small); counter probe collimation, sensitivity and design; methods of scanning the tumour in accessible and poorly accessible sites; and uptake ratios obtained in cases of malignant cutaneous melanoma, cutaneous junctional nævus and choroidal melanoma and metastases. The encouraging results obtained in a preliminary series of eight cases of choroidal melanoma were presented, and the importance of ^{32}P uptake studies, as an aid to the diagnosis of a retinal detachment of uncertain cause, was indicated.

Myrmecia and Warts: Some Radiobiological Considerations.

MR. H. A. S. VAN DEN BRENK and DR. J. HANDLEY presented an analysis of curative effects of radiation treatment of viral and banal warts, based on a series of some 570 cases; the treatment comprised a wide spectrum of radiation dosage from X rays and radium. The results were analysed by correlation of the Strandqvist dose and the effect (cure rate).

On the basis of the effect log dose relationships obtained, an optimal radiation dose for treatment of those conditions was deduced by correlating the statistical validity of the dose-response curves, and the necessary safety factors and precautions taken with radiation treatments. Further analyses were made to determine the effects of fractionation of dose, field size and quality of radiation (half-value layer) on results. The difference in response of viral and banal warts to radiation treatment was examined and detailed.

The demonstration included histological aspects of the architecture of myrmecia, warts and other skin lesions requiring differential diagnosis, and the essential features of intracellular virus inclusions were exhibited.

Details of radium plate dosimetry and late radionecrosis were also given and evaluated.

Ehrlich Ascites Tumour as a Tool in Quantitative Oncology.

MR. H. A. S. VAN DEN BRENK and DR. R. MOTTERAM demonstrated the morphological characteristics of resting and dividing Ehrlich ascites tumour cells in the mouse, by means of preparations of living cells photographed by the Anoptral

phase contrast technique, and from preparations stained by various methods. The chromosomal mode, state of ploidy and idiogram features were demonstrated, in the ascitic form of that growth in the mouse, by the use of the hypotonic squash technique.

The quantitative methods employed in the use of the tumour for chemotherapeutic screening tests were illustrated, and the results of investigations of the effect of peroxides, the catalase inhibitor, methyl-parabenzoic acid and new plant alkaloids on tumour growth were presented.

An unpublished original investigation of the effects of histamine, *in vivo*, on the growth of the tumour in homologous and heterologous animal hosts, was presented, together with the statistical analysis of the results obtained. The characteristics of tissue mast cells and the importance of histamine release in certain radiation effects and immunity responses formed another aspect of fundamental studies being carried out, and some of the animal experiments which had been performed in the radiobiological research unit in relation to those problems were demonstrated.

Medical Physics.

DR. J. H. MARTIN and the physics staff demonstrated the place of a physics unit in a medical organization by illustrating the various categories in which the physics department assisted the medical work. It was pointed out that basically those comprised (*a*) routine work associated with the radiation equipment in use in the clinic, (*b*) work in collaboration with the radiotherapy and other departments of the institute, both routine and developmental in character, and (*c*) research. In the category (*a*), apparatus and records used in the calibration of radiation-producing equipment and the determination of safe working conditions for operating staff were shown. In the category (*b*), various devices and data, such as isodose curves, used in the development of the radiation prescriptions to be applied to the patient, were shown. Along with them were shown various pieces of equipment, such as body "phantoms" and measuring apparatus, used in physical investigations involved in the development of new techniques for treatment of cancer in certain sites. As an example, the process of development of a peripheral radiation technique for post-operative treatment of early stages of cancer of the breast was shown. Descriptions of procedures and apparatus used for diagnostic and therapeutic applications of radioactive isotopes were also on view. Isotopes in use for routine or experimental work included phosphorus 32, iodine 131, chromium 51, iron 59 and gold 198. In the category (*c*), data on investigations on radiation hazards and on the use of photo-conductor materials as detectors for X rays were displayed as examples of research work in progress in the department.

Supervoltage Therapy.

The linear accelerator equipment was demonstrated by the physics staff. Dr. Johnson then discussed the advantages of supervoltage therapy, as compared with conventional deep X-ray therapy. He said they were (i) absence of skin reaction, (ii) improved depth dose, (iii) sharply defined treated volume, (iv) less radiation sickness, (v) less risk of bone or cartilage necrosis, (vi) increased accuracy and (vii) high output.

The type of case suitable for supervoltage therapy was discussed, and four patients who had received treatment were demonstrated. The diagnoses in these cases were: (i) carcinoma of the bladder in an elderly woman; (ii) carcinoma of the floor of the mouth in an elderly man; (iii) carcinoma of the tonsil with metastases in cervical lymph nodes in a middle-aged man; (iv) carcinoma of the larynx with possible metastasis in a middle-aged man.

The Nutritional State of the Cancer Patient.

MISS M. ROGERS and MISS C. N. TURNER, dietitians at the Peter MacCallum Clinic, demonstrated the ways in which the normal diet could be modified to meet the needs of the patient and overcome the malnutrition which so frequently was encountered. It was pointed out that if the cancer patient was to derive the full benefit of any therapy, he must be maintained in a good nutritional state. A wall chart showed the factors which were chiefly responsible for malnutrition in the cancer patient, and suitable dietary modifications where such factors operated. Factors listed were: (i) anorexia, which might be due to worry and fear of diagnosis, vitamin and protein deficiencies or morphine; (ii) mouth and throat lesions, causing difficulty in chewing and swallowing; (iii) mechanical interference, such as mediastinal mass, enlarged spleen or ascites; (iv) radiation reactions, resulting in nausea, vomiting, diarrhœa, dry mouth and loss of taste; (v) defective absorption, due to intestinal lesions or post-irradiation effects.

The following modifications of a normal diet were exhibited: a fluid diet, suitable for tube feeding; a semi-solid diet, using the mechanical food blender; a soft, moist diet, requiring little mastication; a diet low in fibre, eliminating coarse, indigestible food fibres and chemical irritants; a diet of high protein, high vitamin content in a concentrated form; a hyperemesis diet, a regime for the vomiting patient.

The second feature of the demonstration was the dietary regime used for patients undergoing irradiation therapy for carcinoma of the uterus or bladder. It was pointed out that that treatment might produce inflammation of the rectal mucosa and lead to diarrhœa and tenesmus, which were distressing and debilitating to the patient. By avoiding mechanically and chemically irritating foods, it had been possible to eliminate much of the diarrhœa and tenesmus and to maintain a satisfactory nutritional state throughout the course of irradiation. The dietary regime commenced with a low residue diet, and was increased to a bland diet of low fibre content, which was continued for a period of four weeks during the course of irradiation.

Medical Societies.

THE BALLARAT AND DISTRICT BASE HOSPITAL CLINICAL SOCIETY.

A MEETING of the Ballarat and District Base Hospital Clinical Society was held on May 29, 1957.

Tonsillectomy.

DR. I. LOPERT read a paper entitled "The Indications for Removal of Tonsils and Adenoids" (see page 561).

DR. K. C. PORTER read a paper entitled "Tonsillectomy: Pathological Considerations" (see page 564).

DR. N. PESCOTT asked whether it was ever necessary to remove tonsils and adenoids as an emergency in view of gross obstruction to breathing. He also mentioned a case in which it had had to be done.

MR. W. R. GRIFFITHS said that he remembered the days before immunization, when he saw quite a number of patients with diphtheria of the oro-pharynx, and in those days they could smell the condition. He also mentioned that the frequency of true acute tonsillitis was greater than had been mentioned in the papers, and that the general practitioners had a better opportunity of seeing it.

MR. G. R. DAVIDSON asked whether the tonsils should be removed from an adult suffering from halitosis, and when foul-smelling cheesy material could be squeezed out of them.

DR. P. BANTING asked when was the most suitable time for removal of adenoids or tonsils and adenoids in cases of *otitis media* with discharge. He also asked how soon removal of tonsils and adenoids could be performed after an acute attack of tonsillitis in children and adults.

DR. E. R. SHEIL inquired into the relationship between acute rheumatic fever and acute tonsillitis, as well as the advisability of operation.

Dr. Lopert, in reply to Dr. Pescott, said that the size of tonsils and adenoids alone should not be considered an indication for operation. He himself had never seen the operation for removal of tonsils and adenoids performed as an emergency, and had not come across it in literature. In reply to Mr. G. R. Davidson, Dr. Lopert said that, provided other causes of halitosis had been excluded—namely, teeth and stomach disorders—tonsillectomy was indicated. In reply to Dr. Banting's question, Dr. Lopert said that in acute suppurative *otitis media*, it was best to wait until the ear settled down before operating; but in cases of sub-acute or chronic catarrhal *otitis media*, in which the mucoid or mucopurulent discharge persisted, it was thought that the sooner the adenoids were removed, the better was the chance for the ear to dry up. To the second question, he replied that in children the tonsils and adenoids could be removed three to four weeks after an acute attack, but in adults, particularly if there was any suspicion of peritonsillar abscess, it was best to wait up till three months.

PÆDIATRIC SOCIETY OF VICTORIA.

A MEETING of the Pædiatric Society of Victoria was held on October 9, 1957, at the Alfred Hospital, Prahran, Melbourne.

Myositis Ossificans in a Child.

DR. HELEN MURRELL discussed a case of *myositis ossificans* in a child. She said that the patient was a girl, aged eight years, with a five weeks' history of recurrent diffuse swellings over the upper part of the thorax and the neck. The swellings were at first œdematous and firm, later subsiding in area, and forming firm, nodular masses, some of which were of bony hardness. The areas affected were below both scapulæ, extending anteriorly on the left, the left sternomastoid, both biceps muscles, the upper left quadrant of the anterior abdominal wall, and the upper part of the right calf. Ossification was present initially in the region of the biceps muscles, and later in all other areas except the anterior abdominal wall, at a period of five months since the onset of disease. The patient was in hospital for 10 days, and biochemical investigations gave normal results. Microdactyly of the great toes with associated bilateral *hallux valgus* deformity, present in 75% of cases according to the literature, was also present in that patient. The child was free of pain, but fixed flexion deformities of the elbows, limitation of shoulder movement, plantar flexion of the right foot and torticollis persisted and had increased. Muscle biopsy from the right biceps revealed no normal muscle, that having been replaced by fibrous tissue. For four months the patient was given prednisolone in a dosage of 40 milligrammes per day. That was ceased for three weeks when an upper respiratory tract ininfection occurred, and the dosage was reduced to 20 milligrammes per day when her blood pressure rose to 140/80 millimetres of mercury. At the time of the meeting she was having 40 milligrammes daily, with "Distaquaine V", 120 milligrammes daily. At the time of the meeting the movements of her upper limbs were limited, but the patient was cheerful and doing correspondence school lessons.

Dr. Murrell also presented a review of the literature on the subject of *myositis ossificans*.

DR. B. HALLOWES said that he had presented to the Society a patient with that condition in 1943. The lumps had started in the sterno-mastoid muscle and spread to the pectoral muscles. The patient ultimately became bedridden, but retained a sense of well-being.

DR. S. WILLIAMS said that apparently, if they could find the right dose of cortisone, the formation of woody swellings could be slowed down.

Congenital Cystic Kidney Complicated by Pyonephrosis in a Premature Neonate.

DR. W. KITCHEN presented the clinical details of a premature neonate weighing five pounds at birth, who had developed initially *Shigella flexneri* gastro-enteritis at the age of three days. That was followed soon afterwards by a persistent mixed urinary tract infection, which could not be adequately controlled by antibiotics. Pyelography disclosed a non-functioning left kidney, which after nephrectomy at the age of six weeks proved to be hydronephrotic, and the little remaining renal tissue displayed numerous small abscesses. Dr. Kitchen outlined the difficulties in management of the patient and the reason for early operation in that case. He said that operation appeared justified because of the failure to thrive, associated with vomiting and persistent pyrexia of the uncontrolled infection. Follow-up investigation to the age of nine months showed the baby to be thriving and normal; but a cause for concern was the demonstration, at the age of three months, of free vesicoureteric reflux, clearly seen during a micturating cystourethrogram.

DR. DORA BIALESTOCK discussed the pathological material afforded by that case, which was most unusual. She said that a detailed pathological study of the operation specimen had been undertaken. Histological study confirmed the presence of pyelonephritis, but did not do more than suggest the underlying anatomical abnormalities in the nephrons. She discussed the microdissection technique of kidney tissue and how it had been applied to that specimen, and outlined the photographic method of recording findings. Slides showing the types and diversity of the cystic and other abnormal nephron changes were shown. Some of the theories of cyst formation relevant to the case were discussed. Full pathological details of the case will be published later.

DR. A. WILLIAMS said that the technique of microdissection of the kidney described by Dr. Bialestock was interesting, and much might be learnt from its further use. He had always been puzzled by the dilatation of the pelvis in pyelonephritis, and could find no satisfactory reason for it in many cases. That technique added a further tool to the study of such conditions.

DR. J. COLEBATCH asked whether the technique could be applied to material from renal biopsies.

Dr. Bialestock, in reply, said that she thought it could be, even to material from needle biopsy, but nobody had so far tried to do that.

Fœto-Maternal Transfusion.

DR. T. MADDISON discussed a case of fœto-maternal transfusion. He said that it had been known since 1866 that fœtal hæmoglobin was more resistant to denaturation by alkaline solutions than adult hæmoglobin. It was only in recent years that that fact had been used clinically. At birth, the full-term infant had 50% to 90% of its hæmoglobin in the fœtal form, and that decreased during the first two years until the normal adult level of under 2% was reached. Dr. Maddison described how that fact had been used to determine whether bleeding occurring before delivery was fœtal or maternal in origin. He said that Chown, in 1954, had first reported a case in which a high level of fœtal hæmoglobin in the mother, soon after birth, suggested that the baby's anæmia was due to occult bleeding into the maternal circulation before delivery. That was also confirmed by serological means. The case to be presented at the meeting was that of a female infant born at a suburban hospital. She weighed six pounds thirteen ounces, and delivery had been normal after a normal pregnancy. The infant was noticed to be pale next day, and was not sucking well. The mother also observed bruising of the soft palate. On examination of the baby there was an area of bruising on the soft palate one inch in diameter. There were also a few scattered bruises on the chest and arms. The liver and spleen were not enlarged. The hæmoglobin value was 13·2 grammes *per centum*, which was well below the normal range at that age of 17 to 26 grammes *per centum* (mean 22 grammes *per centum*). The blood group was O4, Rh-positive, the same as that of the mother. The estimations of the fœtal hæmoglobin in the mother's blood had been carried out by Miss B. Wilson, of the Royal Children's Hospital, using the method described by Singer, with the following results: 6·1% three days after delivery, 4·1% at four weeks after delivery, 3·0% at 12 weeks after delivery, and zero at 20 weeks after delivery. No active treatment had been necessary for the infant, apart from the administration of vitamin *K* in small dosage and the later addition of some iron to the milk feedings.

Dr. Maddison mentioned the other causes of anæmia in the newborn from hæmorrhage, usually from the placenta or cord. He stressed the importance of those non-hæmolytic anæmias, as the occasional case was so severe that rapid diagnosis and treatment were essential. He said that for practical purposes the differential diagnosis in the severe case was from *erythroblastosis fœtalis, asphyxia pallida* and post-hæmorrhagic anæmia. He had presented that case of fœto-maternal transfusion to show that the condition did occur, and that it was one cause of post-hæmorrhagic anæmia of the newborn.

DR. J. COLEBATCH said that it was important to be aware of that entity. Three cases he had reported in 1956 had occurred within 13 months, but he had seen none since. He thought minor grades of the condition might be common. It should not be mistaken for *asphyxia pallida*. Although it was rare to find severe anæmia on the first day of life from any cause other than erythroblastosis, a transfusion should be given quickly to such a patient.

DR. J. PERRY asked whether enough cases had been reported to ascertain whether that transfusion took place between a mother and baby of different blood groups, and whether it gave rise to antibodies in the mother causing trouble in future pregnancies.

Dr. Maddison quoted one recorded case in which antibodies did occur, but said that in such a case the fœtal hæmoglobin would disappear more rapidly from the mother's circulation.

DR. B. NEAL said that a level of 6% fœtal hæmoglobin in the mother's circulation represented 6% of the mother's total blood volume—300 to 400 millilitres. He thought, therefore, that there must be a slow hæmorrhage over a long period. Other figures recorded were as high as 10% to 12%.

MEDICAL SCIENCES CLUB OF SOUTH AUSTRALIA.

The three hundredth regular meeting of the Medical Sciences Club of South Australia was held on November 1, 1957. The Vice-President (Dr. L. H. May) occupied the chair, as the President (Professor H. N. Robson) was unable to be present. The chairman first called upon the secretary to read the minutes of the first meeting of the Club (April 16, 1920). He then introduced the three speakers, Professor J. B. Cleland, Mr. H. Marston and Professor Sir Kerr Grant, and invited them to give their reminiscences of the early days of the Club.

Professor J. B. Cleland read a paper entitled "Early Meetings of the Medical Sciences Club of South Australia". He recalled how early in 1920, Wood Jones, Brailsford Robertson and Cleland had all arrived in Adelaide to take up their respective chairs, Wood Jones from the Royal Free Hospital and Medical School in London, Brailsford Robertson from San Francisco and Cleland from Sydney. In Sydney, Cleland had belonged to a pathological club where the members discussed work in progress and exhibits of interest were shown (*vide* M. J. Australia, 1915 to 1917). Doubtless a similar body existed in San Francisco. It was thought that in Adelaide a better name would be the Medical Sciences Club, since it covered a wider field and would embrace any branch of science that had some bearing on medicine. The suggestion was put before an inaugural meeting on April 16, 1920, when 14 persons were present, five of whom were still alive (Sir Henry Newland, Sir Raphael Cilento, Dr. H. K. Fry, Dr. L. B. Bull and Professor Cleland). Dr. H. Swift was appointed temporary chairman, and the dynamic Brailsford Robertson temporary honorary secretary; they, together with Wood Jones and Cleland, were asked to draw up a constitution.

The minutes showed that the second meeting was held on May 7, with 19 present (and of those two more were still alive, Dr. C. T. Turner and Professor W. A. Osborne). At that meeting began the presentation of short notes and the exhibition of specimens, recalling to an unusual extent the second of the early meetings of the Royal Society of London (described by Birch in his history of that body). For instance, Wood Jones showed a lizard, the interior of whose dorsal surface, and the dorsal surface of whose testes, were deeply pigmented black, probably as a protection against the ultra-violet rays. Dr. William Ray at that meeting discussed the treatment of fibrosis with iodide and X rays, Robertson showed curves of growth of mice which subsequently developed carcinoma, contrasted with those which did not, and Cilento showed skulls deformed by binding. It was decided that, in addition to the 19 present, Professor W. Mitchell, Professor A. Watson, Dr. W. R. Cavanagh-Mainwaring and Dr. T. G. Wilson should be added to the list of "original members".

At the third meeting on June 4, it was decided to invite Professor Kerr Grant to be a member, and Dr. R. H. Pulleine suggested that he and Professor Robertson should coat electric light bulbs with tyrosine, and ascertain the ultra-violet content of the light emitted. Professor Cleland said that Professor Robertson's minutes of those early meetings were very full and made interesting reading. At the sixth meeting on August 6 it was recorded that Sir Joseph Verco called attention to the fact that lying in bed with the eyes relaxed and looking at the blue sky or white ceiling, one could discern the shadows of the corpuscles traversing the retinal arteries, always following the same network. That had an interesting sequel at the seventh meeting on November 5, when Dr. Fry referred to a case reported in A. Guthrie's "Functional Disorders of Childhood", in which a child saw small round bodies starting from the corner of the visual field, and traversing a definite path which changed into horses when they reached the centre (in other words, into something which the child knew). At the sixth meeting, Cleland called attention to the fatty liver of honey-eating birds, and at the eighth Bull reported the isolation for the first time in Australia of the *Bacillus botulinus* from grain on a winnowing floor. He pointed out the possible danger in the home-canning of fruit and vegetables, unless perfect fruit free from bird-pecks was chosen.

Later minutes showed that Brailsford Robertson suggested to the Club the formation of a journal, which responsibility the Club assumed when it launched the *Australian Journal of Experimental Biology and Medical Science*, generously endowed by Sir Joseph Verco. Its scope was intended to include all aspects of medical science, not only experimental medical science.

The second speaker was Mr. H. Marston, F.R.S., who spoke on "The Development of Our Ideas on Protein Structure". He introduced into his address many personal memories of Professor T. Brailsford Robertson.

Finally Professor Sir Kerr Grant gave a most enjoyable account of "Personal Reminiscences in the History of X rays".

Among the 80 members and guests who attended, there were several of the earliest members of the Club.

AUSTRALIAN LAENNEC SOCIETY.

The annual general meeting of the Australian Laennec Society was held at Hobart on February 27, 1958. Mr. Peter Braithwaite, of Tasmania, was elected President for 1958-1959, and Dr. R. Munro Ford was reelected Honorary Secretary-Treasurer. The activities of each State branch were discussed and the branches were stated to be flourishing in New South Wales, Western Australia and South Australia. The Tasmanian branch was gradually finding its feet. The main business discussed at the meeting was the establishment of the Darcy Cowan Prize and the holding of an Asian-Pacific Tuberculosis Conference in 1960.

The Darcy Cowan Prize has been established to honour the work of Sir Darcy Cowan in the field of tuberculosis. It was proposed that the value of this prize be £50, and that it be awarded each year for a contribution on respiratory disease by a medical graduate aged not more than 30 years, and of not more than five years' standing. It was expected that the first award would be made at the next national meeting of the Society in Melbourne in February, 1959. It was proposed that an Asian-Pacific Tuberculosis Conference be held in Sydney in May or September, 1960.

A scientific session was held at the Tasmanian Chest Hospital. This consisted of an address by the President, Mr. Peter Braithwaite, who spoke on "Advances in Cardiac Surgery".

Out of the Past.

In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.

THE ADMISSION OF WOMEN TO MEMBERSHIP OF THE BRITISH MEDICAL ASSOCIATION.

[From the *Australasian Medical Gazette*, March, 1892.]

At the last meeting of the South Australian Branch of the British Medical Association the question of the admission of women, qualified as medical practitioners, to membership was raised by a resolution of the Hon. Secretary, Dr. Lendon. The matter has also engaged the attention of the Victorian Branch, and it might advantageously be discussed by that of New South Wales. A rule of the parent Society excludes ladies from membership, but the time is now past when such a course can logically be defended, and we think that the Australian Branches will do well to conjointly approach the Council in Great Britain asking its repeal. Dr. Lendon, in moving as he has in the subject, has done good service, and we hope he will succeed, as for the credit of our profession for liberality and progress he should do. The subject became of immediate interest as a consequence of the application of Miss Laura Fowler, M.B. and Ch.B., of the Adelaide University, for admission to membership, and now that there are ladies registered as medical practitioners in the three colonies having branches of the British Medical Association, the question is one of instant moment to each of them. For ourselves we do not hesitate to say that we think that a lady who has obtained diplomas entitling her to registration has an equal right to membership of Medical Societies as a male practitioner and that her admission should be yielded promptly and gracefully.

[When a circular was sent to members of the South Australian Branch asking them for their opinion on this matter, of 96 members, 75 replied, 46 were favourable, 20 unfavourable and nine indifferent.]

Correspondence.

FLUORIDATION OF PUBLIC WATER SUPPLIES.

SIR: Our attention has been drawn to the letter by N. D. Martin (M. J. AUSTRALIA, February 22, 1958), which refers to your editorial "Fluoridation of Public Water Supplies" (M. J. AUSTRALIA, February 1, 1958) and to our paper in the same issue of the Journal (page 139).

We consider that Associate Professor Martin's statement that "The evidence which supports the efficacy of fluoridation is overwhelming, a point well made in the excellent editorial on the 'Fluoridation of Public Water Supplies'", does not accurately interpret your words which were: "Fluoridation of public water supplies is still a live controversial issue. Informed and responsible opinion is still divided on its effectiveness as a prophylactic measure against dental caries and even on its safety. It must be acknowledged that the general trend seems to be towards its acceptance as a sound public health measure, and as a matter of practical politics a good case can be put up for this."

Martin then followed by writing: "It is regrettable that the criticism of Sutton and Amies is euphemistically placed on 'the detached scientific level'." We feel that your editorial use of that phrase cannot be considered to be euphemism, still less a criticism, of a sincere contribution to a scientific journal.

Associate Professor Martin does not refute the observations which we gave to illustrate the disturbing deficiencies which we mentioned in the reports of certain fluoridation trials. However, we would like to comment on the three points which he raised:

1. He criticized our statement that "proposals to fluoridate domestic water are almost entirely based" on the reports of the experimental trials conducted in Brantford, Grand Rapids, Newburgh and Evanston. He mentioned the historical background of fluoridation, and cited page 21 of the Report of the United Kingdom Mission[1] as the source of his remarks. (Page 21 of our copy of this report does not refer to historical background.) The fact remains that very few cities commenced fluoridation programmes until after the early reports from these trials had been published.

2. Martin said that: "The X-ray examinations at Newburgh and Kingston began in 1949-1950, five years after the commencement of the study, not eight, as Sutton and Amies state." In fact, our statement was that the authors of that trial "instituted a combined clinical and X-ray study eight years after the commencement of the ten-year investigation". As confirmation of our statement, Ast, Bushel, Wachs and Chase[2] pointed out that "the data in this report cannot be compared directly to those earlier data based on clinical examinations alone".

In commenting on the X-ray examinations to which Martin referred (which also illustrated our point that randomization was employed in examining the X rays, but not in the clinical examinations), Ast, Finn and Chase[3] said that: "In the present report an attempt is made to demonstrate that through an objective roentgenographic examination of the teeth of selected age groups, the question of examiner bias in this study is not likely to account for the differences noted." Only three out of the seven age groups were examined, and data were shown only for the first permanent molars; the results for all the other permanent teeth, and for the deciduous ones, were not published.

3. Martin said that "the DMF figure is criticized as being inaccurate because of subjective variation, different examiners, standards of assessment and the time interval between examinations"; however, our criticism was levelled, not at "the DMF figure", but at the failure of the authors of all these trials to assess the magnitude of the errors produced by these factors mentioned.

The attitude of Associate Professor Martin to this matter is clearly disclosed when he stated that "the coincidence of these findings [from these trials] does not need the application of the statistical methods to eliminate chance". As the findings were based on numerical data which were subject to errors, it should be obvious that it cannot be established whether they were coincident or not, except by the use of statistical methods.

The recent endorsement of fluoridation by the WHO Expert Committee on Water Fluoridation (Press Release WHO/45, September 4, 1957), which Martin mentioned, was not unexpected, for a number of the members in their writings on this subject have accepted the findings of the authors of the reports of the fluoridation trials mentioned.

Having indicated flaws in the methods of assessment used in the trials quoted, we are not yet convinced on the question of fluoridation. We feel we must wait until a more complete examination has been made of the numerical data published, rather than accept the present endorsement by various bodies, however august.

Yours, etc.,

PHILIP R. N. SUTTON,
ARTHUR B. P. AMIES.

193 Spring Street,
Melbourne, C.1,
March 29, 1958.

[1] "The Fluoridation of Domestic Water Supplies as a Means of Controlling Dental Caries", Report of the United Kingdom Mission, London, February-April, 1952.

[2] Ast, D. B., Bushel, A., Wachs, B., and Chase, H. C. (1955), *J. Am. Dent. A.*, 50: 680 (June).

[3] Ast, D. B., Finn, S. B., and Chase, H. C. (1951), *J. Am. Dent. A.*, 42: 188 (February).

THE PATIENT, THE SURGEON AND THE ANÆSTHETIST.

SIR: In the Journal of December 28, 1957, I posed the question: "What should be the anæsthetist's response when he is asked to give an anæsthetic to a desperately ill patient who, in the opinion of his surgeon, may possibly be saved by operation, but who, he thinks, is sure to die if operation is withheld?" I illustrated the significance of this question with two case histories, listed some of the reasons given by the anæsthetists for refusal, and invited comments to the question from your readers. The few replies were unsatisfactory because none of them really answered the question and some were quite irrelevant. E. R. Reid, for example, said that I had "overlooked the efforts made during the last decade, by the various Colleges of Surgeons and their associated faculties of anæsthesia, in promoting the art and science of anæsthesia". But surely it is because I did appreciate the high standard of modern anæsthesia that I expected my anæsthetist colleagues to give their services in the "bad risk" cases I cited. Reid then says that the approach should have been: "What pre-operative care can we give to this patient to render him or her fit for anæsthesia?" This is too elementary to need discussion. I give my word that with my two patients measures to overcome infection, anæmia, tension pneumothorax, etc., had been undertaken before the anæsthetist was consulted. Reid seems to go further astray when he says: "In a team the surgeon and anæsthetist must visit a critically ill patient frequently in order to choose the optimum moment for operation", and "in a well balanced team the surgeon will respect the advice of his colleague and cancel or defer the operation". It is quite clear from the description of my patients that urgency precluded frequent visits and that cancelling or deferring operation meant leaving the patient to die. The essence of my letter is whether, under these circumstances, the anæsthetist is justified in carrying his opposition to the stage of refusing his services.

G. Christensen and G. J. Kennedy raise some interesting points, but they wander too far from the subject.

The comments of Robert B. Speirs call for more notice. No one denies that "anæsthetic responsibility rests upon the anæsthetist alone", just as surgical responsibility rests upon the surgeon alone. That it is the anæsthetist who is called to a coroner's inquiry into a "death on the table" is due, not to the surgeon, but to law or custom. But this pother about the coroner is exaggerated, because, with few exceptions, he dispenses with an inquest in the kind of case cited, and if at any inquest the anæsthetist finds himself embarrassed, then the surgeon is always available to give evidence either voluntarily or by command. Speirs then proceeds: "From the nature of their work anæsthetists tend to accumulate what might be termed acute experience far more rapidly than surgeons of equivalent standing; the number of cases involved might well be six times or greater over any given period of time." The great majority of cases that anæsthetists handle are ordinary routine ones. The type of case discussed by me is comparatively rare, and it is hard to believe that any one anæsthetist sees six times as many such cases as any one surgeon. Perhaps Dr. Speirs can give some evidence to support this surprising supposition. His remark that "it is not my experience that a sick patient

usually realizes his danger" tends to contradict his claim and to make one wonder whether he has really grasped the fact that my patients were dying of surgical complications. I was at pains to point out that it was irrelevant to talk of risks as these were already appreciated, so that Speirs's view that "there can be no presumption that the surgeon will know the risks better when short term prognosis is being assessed" is quite irrelevant and untenable. Another statement that requires support if it is to be taken seriously is that "the possibility of death under the anæsthetic often seems to be clearest of all to the anæsthetist and much less clear to others". I, for one, can see no reason to accept this sweeping claim on its face value and I ask for further evidence for it. I certainly made it clear that there was a great risk of death under an anæsthetic in my cases, but that operation alone gave the patient a chance. In these circumstances the anæsthetist does not have to justify the giving of an anæsthetic; rather he has to justify his refusal. If the anæsthetist and surgeon bring all skill and care to their efforts, it is nonsense to bring in the platitude "that most people still accept a moral principle that one shall not kill". In the kind of case described by me all that can be said, if the patient dies, is that an attempt was made to save a dying person and that it failed. Speirs asks why the surgeon's opinion should be made paramount. I anticipated this question by pointing out that the surgeon is the leader of the team and that it is he who is responsible to his patient (not the anæsthetist's patient) for carrying out the necessary treatment. In the same sentence Speirs complains that the anæsthetist's opinion is called impertinent. What I said was that one reason for the anæsthetist refusing his services was that he questioned the surgeon's judgement that operation was necessary, and I added: "If the surgeon concerned is well trained and experienced, the anæsthetist's opinion is impertinent *unless he can produce evidence that the surgeon's assessment is wrong.*" If this qualifying clause is not omitted my comment is fair and understandable.

In conclusion, I think that the question raised should not be left in its present unsatisfactory state of doubt and confusion. I hope that the Journal's pages are still open to correspondents and that more anæsthetists and surgeons will give their views. The suggestion that the Faculty of Anæsthetists and allied bodies ought to consider the matter should be noted by these groups.

Yours, etc.,

185 Macquarie Street,
Sydney,
March 27, 1958.

M. P. Susman.

SIR THOMAS DUNHILL.

Sir: One small but significant fact seems to have been overlooked in the tributes to the late Sir Thomas Dunhill. His home in London was named "Tragowel" as a constant reminder of the little hamlet in northern Victoria where he was born.

Yours, etc.,

19 Murphy Street,
South Yarra, S.E.1,
Victoria.
April 7, 1958.

J. Stewart Legge.

STAFFING OF BASE HOSPITALS.

Sir: It is with apprehension that I note that Council are of the opinion that "base hospitals should be staffed by classified staffs" in their memoranda to members in New South Wales, dated March 17, 1958. My misgivings at this B.M.A. support of Hospital Commission policy are based on my own experience as follows:

On seeking a base hospital physician's appointment, after consideration by the Medical Appointments Advisory Committee and the Board, I was informed that: "The Committee is of the opinion that Dr. Glasson should be recommended for the position Honorary Medical Officer. It feels that Dr. Glasson should not be classified as an honorary physician, as it is only a little over four years since his graduation, and he has not acquired any post-graduate degrees or diplomas." My appointment as an honorary medical officer (i.e., neither physician nor surgeon) precludes me from acting as honorary medical officer of the week for medical or surgical cases not referred from an outside practitioner.

There are, and will be for some years, a large proportion of men in base hospital towns with an M.B. and B.S. only, who will either be dealt with as above or find themselves falsely classified into the role of physician or surgeon. This classification precludes entry to the medical or surgical section, as the case may be, of the public wards. Then even such minor out-patient procedures, as, for example, the opening of an abscess, must be performed by an honorary surgeon, unless the patient is willing and able to pay an intermediate fee. I feel that the whole matter is but a step towards relegating the general practitioner to medical clerkship.

Yours, etc.,

118 Edward Street,
Orange East,
New South Wales.
April 7, 1958.

J. G. Glasson.

"OUT OF THE PAST", OR "INTO THE FUTURE"?

Sir: The almost simultaneous arrival of the *British Medical Journal* dated January 25, 1958, and your issue of March 22, 1958, rustled the leaves in an early chapter of a dusty tome. The former contained an article on the Brandt-Andrews technique, and the latter Dr. A. M. Hill's letter.

Many years ago the late Professor Marshall Allan was engaged on a tour of inspection of country maternity hospitals, and, in due course, arrived here. My late father, Dr. J. T. Kennedy, was in practice at the time, and the solitary wide-eyed audience will never forget the din in the sitting room here. The subject under discussion was traction on the cord, and the two old Rotunda boys—same vineyard, different vintage—were hard at it. When all is said and done, it was not a very lengthy path from venesection to transfusion, and, who knows, "Into the Future" may well prove it to be a circular one.

If Nino ever forsakes the wheel-barrow and transfers his affections to the hospital trolly, another best seller will most assuredly follow, but what on earth would he call it?

Yours, etc.,

Cobram,
Victoria,
March 31, 1958.

G. J. Kennedy.

HISTAMINE AND SKIN CANCER.

Sir: For some years I have been employing histamine therapeutically in the treatment of disease and some very remarkable facts have been evolved. It has long been known that in asthma, urticaria and other allergic phenomena there was an outpouring of histamine into the tissues and that adrenaline immediately checked this, adrenaline being the active agent of the sympathetic system. It was not so well known that the use of histamine counteracted excessive sympathetic activity. When organisms invade a tissue like joints, we say that tissue has become sensitized, if histamine is injected into a patient with acute arthritis the pain is relieved in a matter of minutes, behaving as rapidly as adrenaline does in asthma. This anybody can try for themselves. When 0·1 cubic centimetre of histamine acid phosphate is injected intradermally into the forearm there is a local reaction forming a large weal with a general flushing of the tissues, markedly in the face, and some throbbing in the head, according to the size of the dose. Employing it in cases of psoriasis, one noticed that all the lesions were flushed with fluid which gradually subsided; when this had been repeated a certain number of times they vanished completely. In employing this treatment on some cases of keratosis with definite malignant nodules on hands, face and ears, one was astounded at the rapidity with which they resolved, especially when thyroid extract was employed at the same time. The harsh scaly skin in these conditions is an indication of thyroid deficiency, and many cases which look like developing malignancy respond to thyroid alone. As thyroid deficiency develops and definite myxœdema results, the lymphatic secretion becomes bogged up in the tissues interfering with lymphatic drainage, so one cannot

fail to see that lymphatic stasis is a predisposing factor in the development of skin cancer. My own personal experience may be of interest to others and induce them to try out this form of treatment.

Last November, Dr. Paterson and his wife were visiting Australia on the cancer problem. Whilst dining with us, Dr. Paterson, who was sitting on my left, said: "You have an epithelioma on your hand." I said: "Yes, I am keeping it for experimental purposes." On November 18 I had 0·1 cubic centimetre of histamine acid phosphate injected into my forearm with some slight general reaction and local swelling. This was repeated on November 20. On November 26 I injected 0·05 cubic centimetre half an inch distally to the lesion. This caused swelling of the lesion and surrounding area. The same was repeated on November 28. By this time there was a marked reduction in the size of the lesion. On December 11 this was repeated. By then skin was growing over what before had been a raw surface, and all thickening had vanished. One can only be struck with the rapidity of the action of histamine and the small doses employed.

Yours, etc.,

626 Sturt Street,
Ballarat,
Victoria.
April 11, 1958.

SYDNEY PERN.

MEDICAL EDUCATION.

SIR: I have long felt that the average medical student arrives at hospital work ill equipped for clinical work. The change from theoretical to practical work is a very sudden one, and there are many students temperamentally endowed to do well at the former who find the latter difficult, if not at times impossible to cope with—others vice versa—while actually what is required of them is that they should be equally proficient in both spheres. Similarly, students who are able to appreciate the duties and ability, or otherwise, of the nursing staff are in a position to do so much more for their patient, and also able to learn those finer points in dealing with patients which a good nurse learns after years of practical experience in the wards and out-patients. There are many students who never proceed beyond the first year or two of their medical training and carry away with them no knowledge which they could put to practical advantage.

I would like to see the curriculum for the first year in medicine altered so that the year is divided in half, and each half alternately to spend six months in the different training hospitals employed as trainee nurses. The experience thus gained would show them the normal working of a hospital, the discipline required, the difficulties in hospital administration, the need for accuracy in the administration of drugs, the needs of a patient, the sight of the injured, dying and mentally disturbed. The approach then to the rest of the course will be viewed in its proper perspective, and one feels that unsuitable material will be detected earlier and all will have better ability to deal with sudden emergencies, whether of peace or wartime, at an earlier date. To the above advantages may be added the fact that the nursing situation would be immediately alleviated, and in these days of talk about the need of establishing a new medical school, anything which ensured a smaller number of students at one time would be welcome.

Perhaps in this connexion a change in curriculum might be more advantageous than a change of address, and would ensure a uniformity of teaching and high standard of learning of the resultant doctors. Is it necessary that the whole of one year should be studying each subject at the same time? Could not the situation be dealt with by rotation of groups at each subject to be studied, but by a final yearly examination in each subject which is the same for each student and which is under the jurisdiction of the one examining body? And surely this whole problem is within the province of the University and the Medical Faculty in particular? One would not go to a parliamentarian with toothache!

Yours, etc.,

19 Hunter Road,
Mosman,
New South Wales.
April 3, 1958.

MARGARET ADDISON.

Post-Graduate Work.

SEMINARS AT SYDNEY HOSPITAL.

THE following seminars will be held on Wednesdays from 2 to 3 p.m. in the Maitland Lecture Hall, Sydney Hospital, during May and June, 1958. These seminars will be preceded by medical grand rounds (Maitland Lecture Hall) at 12 noon, lunch at 1 p.m., and pathological demonstrations (Maitland Lecture Hall) at 1.30 p.m. May 7, "Recent Pharmacological Research in Edinburgh", Professor J. H. Gaddum, F.R.S. (Edinburgh), overseas visitor. May 14, "Gastro-Intestinal Hæmorrhage", Dr. A. W. Morrow (Royal Prince Alfred Hospital), Sydney visitor. May 21 (Cardio-Vascular Clinic), "Salt Metabolism in Hypertension", Dr. G. B. Mackaness, Australian National University, Canberra. May 28, "Electrolytes in Nervous Action", Professor P. O. Bishop, Department of Physiology, University of Sydney. June 4, no seminar. June 11 (Thoracic Clinic), "Sarcoidosis: At Sydney Hospital", Dr. B. R. M. Hurt. June 18, "Pathogenesis of Œdema", Dr. F. C. Courtice, Kanematsu Institute. June 25 (Gastro-Enterology Clinic), "Gastro-Intestinal Polyposis and Malignancy", Dr. D. G. Harbison.

The College of General Practitioners.

QUEENSLAND FACULTY.

Post-Graduate Week-End.

THE Queensland Faculty will hold a post-graduate week-end at Broadbeach from May 2 to May 4, 1958. The programme will be as follows: Friday, May 2: 8 p.m. to 10 p.m., registration and informal party, Conference Room, Lennon's Broadbeach Hotel. Saturday, May 3: 10 a.m., official opening by Dr. the Honourable Donald A. Cameron, O.B.E., M.P., Minister for Health. 11 a.m., "Iatrogenic Disease", Dr. T. M. Greenaway. 2 p.m., "Digest of Progress", Dr. Kurt Aaron, chairman; "The Modern Treatment of Varicose Ulcers", Dr. Neville C. Davis; "Antibiotics and Diuretics", Dr. John M. Sutherland; "The Use of Endocrines in Gynæcology", Dr. Keith G. Cockburn; "Tranquillizers", Dr. Howard Tait; 4 p.m., "Research in General Practice", Dr. David Johnson and Dr. David Henderson. Sunday, May 4: 10 a.m., "Symposium on Bronchial Asthma", Dr. Kurt Aaron, chairman, Dr. John Fitzwater, Dr. W. D. Domville Cooke and Dr. Howard Tait; 11.30 a.m., "Drug Reactions and Their Significance", Dr. T. M. Greenaway.

Naval, Military and Air Force.

APPOINTMENTS.

THE following appointments, changes, etc., are published in the *Commonwealth of Australia Gazette*, No. 21, of April 10, 1958.

AUSTRALIAN MILITARY FORCES.

Australian Regular Army.

Royal Australian Army Medical Corps (Medical).

The following officers are appointed from the Regular Army Special Reserve, and to be Captains, 6th January, 1958, with a Short Service Commission for a period of two years: Captains 3/40148 R. M. Compton and 2/40200 R. M. Tracey.

Regular Army Special Reserve.

Royal Australian Army Medical Corps (Medical).

The following officers are appointed to the Australian Regular Army, 6th January, 1958: Captains VX700375 R. M. Compton and NX700471 R. M. Tracey.

To be Captain, 6th January, 1958: NX700481 Lieutenant L. A. Duncombe.

To be Lieutenants, 1st January, 1958: QX700209 Ronald Ernest Thiel, QX700208 Raymond Neil Hurley, NX700487 Michael Anthony Naughton, NX700486 Adrian Kenneth

Chalker, SX700113 Zdenek Staska and SX700112 Vladislav Matousek.

Citizen Military Forces.

Northern Command.

Royal Australian Army Medical Corps (Medical).—The following officers are appointed from the Reserve of Officers: 1/46756 Captain G. Borzi, 20th December, 1957, and 2/146600 Captain (provisionally) R. G. R. Sim, 20th January, 1958. The provisional appointment of 1/61844 Captain A. Davison is terminated, 31st December, 1957. To be Captain (provisionally), 1st January, 1958: 1/61844 Alan Davison.

Eastern Command.

Royal Australian Army Medical Corps (Medical).—2/130118 Captain (provisionally) D. J. Roebuck relinquishes the provisional rank of Captain, 2nd December, 1957, and is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Eastern Command) in the honorary rank of Captain, 3rd December, 1957. 2/79312 Captain (provisionally) P. R. Degotardi relinquishes the provisional rank of Captain, 8th December, 1957, and is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Eastern Command), and is granted the honorary rank of Captain, 9th December, 1957. 2/56844 Captain (provisionally) R. J. McArthur relinquishes the provisional rank of Captain, 11th December, 1957, and is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Eastern Command), and is granted the honorary rank of Captain, 12th December, 1957. 2/139202 Captain P. C. P. Waugh is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Eastern Command), 31st December, 1957. To be Captain (provisionally), 11th February, 1958: 2/139768 James Hamilton Hooper.

Southern Command.

Royal Australian Army Medical Corps (Medical).—3/51002 Colonel W. W. Lempriere, D.S.O., E.D., is appointed from the Reserve of Officers, and is appointed Consultant Dermatologist, Army Headquarters, 1st January, 1958. 3/50269 Lieutenant-Colonel (Honorary Colonel) T. G. Swinburne, E.D., is appointed from the Reserve of Officers, is appointed Consultant Oto-Rhino-Laryngologist, Army Headquarters, and to be Colonel, 6th February, 1958. The provisional rank of F3/1019 Captain P. B. Blackall is confirmed. 3/101011 Captain C. W. E. Wilson ceases to be seconded whilst in the United Kingdom, 4th November, 1957. The notification respecting F3/1019 Captain (provisionally) P. B. Blackall, which appeared in Executive Minute No. 97 of 1956, promulgated in Commonwealth Gazette No. 43 of 1956, is withdrawn. F3/1019 Captain P. B. Blackall is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Northern Command), 2nd June, 1956. 3/101031 Captain R. C. W. Williams is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Southern Command), 30th November, 1957.

Central Command.

Royal Australian Army Medical Corps (Medical).—4/31918 Honorary Captain C. S. Kneebone is appointed from the Reserve of Officers, and to be Captain (provisionally), 21st January, 1958.

Western Command.

Royal Australian Army Medical Corps (Medical).—5/26527 Captain (provisionally) D. G. Kermode is seconded whilst in the United Kingdom, 1st December, 1957. 5/26525 Captain C. J. Benson ceases to be seconded whilst in the United Kingdom, 1st January, 1958.

Royal Australian Air Force.

Permanent Air Force.

Medical Branch.

The probationary appointment of the following officers is confirmed: Squadron Leader R. P. V. Checcucci (0311661), Flight Lieutenants F. I. Walke (021787) and E. R. Bowler (0310759).

The resignation of the following Flight Lieutenants is accepted: J. N. Burry (0310758), 14th November, 1957; B. A. Hintz (014532), 20th December, 1957.

The notification regarding the grant of special leave without pay to Pilot Officer (Student) I. L. Ferguson (0312882), as approved in Executive Council Minute No. 24 of 1957, appearing in Gazette No. 34, dated 13th June, 1957, is withdrawn.

Pilot Officer (Student) I. L. Ferguson (0312882) is granted special leave without pay, 29th October, 1956, to 13th October, 1957, inclusive.

Active Citizen Air Force.

Medical Branch.

No. 22 (City of Sydney) Squadron: Flight Lieutenant B. L. Reid (0211584) is promoted to the rank of Squadron Leader, 1st December, 1957.

Australian Medical Board Proceedings.

NEW SOUTH WALES.

The following additions and amendments have been made to the Register of Medical Practitioners for New South Wales in accordance with the provisions of the *Medical Practitioners Act*, 1938-1957:

Registered medical practitioners who have complied with the requirements of Section 17 (3) and are registered under Section 17 (1*a*) of the Act: Gunter, Robert Paul Stretton, M.B., B.S., 1955 (Univ. Melbourne); Lenaghan, Leo, M.B., B.S., 1955 (Univ. Melbourne).

Registered medical practitioners who have complied with the requirements of Section 17 (3) and are registered under Section 17 (1*b*) of the Act: Christensen, Frederick George, L.M.S.S.A. (London), 1952, D.D.Sc., 1954 (Univ. Queensland), F.D.S., R.C.S. (England), 1952, H.D.D., R.C.S. (Edinburgh), 1938; Forsayeth, Richard Martin, M.R.C.S. (England), L.R.C.P. (London), 1926; Humphrey, Reginald Alexander Milne, M.B., Ch.B., 1926 (Univ. Aberdeen); Mackay, Angus, M.B., B.S., 1954 (Univ. London).

Registered medical practitioner who has complied with the requirements of Section 17 (3) and is registered under Section 17 (1*e*) of the Act: Ravazdy, Stefan, M.D., 1943 (Univ. Szeged).

Registered medical practitioner who has complied with the requirements of Section 17 (3) and is registered under Section 17 (2*a*) of the Act: Richne, David, M.D., 1937 (Univ. Leipzig).

Registered medical practitioners who are required to complete twelve months' hospital service in accordance with the provisions of Section 17 (3), and are registered under Section 17 (1*a*) of the Act: Ashton, John Winter, M.B., B.S., 1955 (Univ. Melbourne); Pitts, Brendan Michael Joseph, M.B., B.S., 1957 (Univ. Melbourne); Smith, Sinclair Joseph, M.B., B.S., 1955 (Univ. Adelaide).

Registered medical practitioners who are required to complete twelve months' hospital service in accordance with the provisions of Section 17 (3) and are registered under Section 17 (1*a*) of the Act, the qualification in each case being M.B., B.S., 1958 (Univ. Sydney): Alexander, Michael; Allison, Patricia Diana; Beal, Robert William; Belfer, Joseph Boris; Bench, Graham John; Bolin, Terry Dorcen; Bookallil, Michael John; Bosch, Edward Graham; Braggett, Michael Ernest; Burke, Kenneth James; Burkitt, Barbara Frances Erma; Burstall, James Richard; Burton, Shirley May; Cameron, Robert Stewart; Carmody, John Spohn; Chapman, Robert John; Chong, Anthony Ngian On; Chow, Chong Ling; Clark, Graeme Milbourne; Clearly, Maurice Patrick; Clumeck, Jean Marie; Connolly, Justin Barry; Connolly, Michael Alfred Francis; Cooke, Ian Douglas; Coy, Lawrence Bernard; Craigie, David John; Csillag, Erwin Robert; Davis, Geoffrey Lancelot Rutter; Deal, Cedric William; Deegan, Robert James; Diamond, John David; Dorsch, Susan Evelyn; Driscoll, Paul Richard; Duke, Peter Edgar Swinnerton; Duncombe, Leslie Albert; Dunea, George; Emberson, Felix Alexander Stanley; Evans, William Anwyl; Farley, Maree Mildred; Faulks, Lewis William; Ferry, Anne Agatha; Foote, Alan Gregory; Francis, John Fulton; Fraser, Rex Britnell; Fraser, Robin; Freeman, Ronald; Gan, Paul Eng Poh; Gillespie, Ailsa Margaret; Gillett, David John; Grant, Kevin Francis; Grausz, John Paul; Hackett, Robert Edward; Hamilton, Robert Ian Charles; Harpur, Michael Hunter; Harris, Kenneth Godfrey; Hiatt, Geoffrey James; Hunt, Jann Margaret; Huxtable, John Harding; James, Alan Ashley; Johnston, Colin Ivor; Jolley, Frederick Reidy; Jones, Louise Elizabeth; Kellerman, Gordon Ellis; Knott, Bernays Melville; Langley, Alfred Robert McKenzie; Lim, Joo Hai; Lucas, Garry Roland; Lucas, Lorna Mary; McDonough, Eugene Joseph; McIntosh, Angus John; McTaggart, Donald Raymond; Macdonald, Roderick Donald; Maloof, Clement Joseph; May, James; Mellick, Ross Sleaman; Miles, Peter

Hunt; Miller, Douglas Alfred Frank; Monaghan, Brian John Anthony; Nihill, Caroline; O'Connor, Daniel Michael; O'Neill, Brian James; O'Sullivan, Peter Robert; Owen, Earl Ronald; Paine, Robert Lansdell; Pang, Henry; Pardoe, Russel; Parker, Brian John; Perkins, Kenneth William; Phillips, Allison Dianne; Plummer, Barry John; Porges, Stuart Barrington; Prineas, John William; Pritchard, Elizabeth; Raby, Justin Bernard; Raphael, Beverley; Read, David John Clarence; Robinson, Eleanor Mary; Roche, Brian William; Roser, Bruce Joseph; Runcie, Donald George; Russell, Diana Murchison; Salega-Starzecki, Boleslaw; Scott, Harry Sinclair; Scotton, Roderick Warren; Shead, Geoffrey Vernon; Sheather, Rosemary; Shepherd, Bruce Dalway; Sinclair, Agnes Esther; Singer, Kurt; Slavotinek, Anthony Hynek; Stackpool, James Cornelius; Taylor, John Stuart; Taylor, Roger Ralph; Thompson, Blanch; Thwaites, Brian Arthur; Tohver, Avo; Tonkin, Lawrence Kevin; Tonking, Barbara Mary; Toohey, John Michael; Torda, Thomas Andrew Gabriel; Tuckwell, Leonard Arthur; Tugwell, Wilton Dunstan; Tyrrell, Margaret Dulcie; Vandenberg, Russell Anthony; Venerys, John Efstratios; Vial, Kenneth John; Warren, Ronald Herbert; Weston, Marguerite Nash Munro; White, Peter Wilton; Williams, Ronald George; Willis, Carole Patricia; Wilson, Ian Herbert; Wise, Grahame Allen; Wise, Leslie; Withers, Kelvin Lawrey; Wolrige, Lucy Jean; Wong, Siew Poh; Woolnough, Helen Corinne.

The following has been issued with a licence in accordance with the provisions of Section 21c of the Act: Temesvary, Andrew, M.D., 1952 (Univ. Zurich).

QUEENSLAND.

THE following have been registered, pursuant to the provisions of Section 19 (1) (*a*) and (*c*) of *The Medical Acts*, 1939 to 1955: Douglas, William Alexander Charles, M.B., B.S., 1956 (Univ. Queensland); Lonergan, Francis Noel, M.B., B.S., 1957 (Univ. Queensland); Wilson, Charles Roy, M.B., B.S., 1956 (Univ. Queensland); Fletcher, Garth Trevor, M.B., B.S., 1957 (Univ. Queensland); Beardmore, Graeme Leslie, M.B., B.S., 1957 (Univ. Queensland); Dewar, Malcolm Thomas, M.B., B.S., 1956 (Univ. Queensland); Crawford, Robert Harold, M.B., B.S., 1957 (Univ. Queensland).

The following have been registered, pursuant to the provisions of Section 19 (1) (*a*) and (*d*) of *The Medical Acts*, 1939 to 1955: Bradfield, Claude Wilfred Patrick, D.M.R.D., R.C.P. (London), R.C.S. (England), 1949; Bouvier, Boyd Stuart, M.B., B.S., 1951 (Univ. Melbourne), F.R.A.C.S., 1957; Tierney, Beryl Gladys Rankin, M.B., Ch.B., 1948 (Univ. Manchester); Cleminson, Kenneth Leonard, M.B., B.S., 1947 (Univ. London); Skinner, Edward Welby Offord, M.R.C.S. (England), L.R.C.P. (London), 1936, D.A., R.C.P. (London), R.C.S. (England), 1938, F.R.C.S. (Edinburgh), 1948; Davis, Raymond James, M.B., B.S., 1949 (Univ. London), D.Obst., R.C.O.G., 1951.

The following additional qualifications have been registered: Phillips, John Hardwick, F.R.C.S. (England), 1957, F.R.C.S. (Edinburgh), 1957; Stringer, Robert Eric Charles, M.C.R.A., 1957.

The following have been granted limited registration, pursuant to the provisions of Section 20 (3) of *The Medical Acts*, 1939 to 1955: Douglas, Edward Alexander Brookes, M.B., B.S., 1958 (Univ. Queensland); Jackson, Neil Ernest Sandford, M.B., B.S., 1958 (Univ. Queensland); Palietis, Jonas, M.B., B.S., 1958 (Univ. Queensland); Pincus, David Fabian, M.B., B.S., 1958 (Univ. Queensland); Raiti, Salvatore, M.B., B.S., 1958 (Univ. Queensland); Suchting, Colin Graham, M.B., B.S., 1958 (Univ. Queensland); Vereschagin, Alexander, M.B., B.S., 1958 (Univ. Queensland); Brannelly, Brian Patrick, M.B., B.S., 1958 (Univ. Queensland).

TASMANIA.

THE following have been registered, pursuant to the provisions of the *Medical Act*, 1955, of Tasmania, as duly qualified medical practitioners: Wallington, Ian Harry, M.B., B.S., 1950 (Univ. London), M.R.C.S. (England), L.R.C.P. (London), 1950; Rayner, Henry James, M.B., B.S., 1953 (Univ. London); Burton, Patrick Andrew, M.B., B.S., 1956 (Univ. Adelaide).

The following have been provisionally registered, pursuant to the provisions of Section 14A of the *Medical Act*, 1955, of Tasmania: Chin, Kui Sang, M.B., B.S., 1957 (Univ. Melbourne); Southwell, William Bramwell Arnott, M.B., B.S., 1957 (Univ. Melbourne).

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED APRIL 5, 1958.[1]

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism	1(1)	1(1)	5(1)	..	..	..	..	..	7
Amœbiasis	..	..	..	..	..	..	..	..	..
Ancylostomiasis	..	..	5	..	..	..	1	..	6
Anthrax	..	..	..	..	..	..	..	..	..
Bilharziasis	..	..	..	..	..	..	..	..	..
Brucellosis	1	..	..	..	..	..	..	..	1
Cholera	..	..	..	..	..	..	..	..	..
Chorea (St. Vitus)	..	..	..	..	..	..	..	..	..
Dengue	..	..	..	..	..	..	..	..	..
Diarrhœa (Infantile)	2	8(7)	..	..	..	..	1	..	11
Diphtheria	..	..	..	..	1(1)	..	..	..	1
Dysentery (Bacillary)	..	6(6)	1(1)	..	1(1)	..	1	..	9
Encephalitis	1(1)	..	..	..	..	..	..	..	1
Filariasis	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice	..	..	..	..	..	..	..	..	..
Hydatid	..	..	..	..	..	1	..	..	1
Infective Hepatitis	30(18)	2(2)	8	4(4)	16	1(1)	..	..	56
Lead Poisoning	..	..	..	..	..	..	..	..	..
Leprosy	..	..	1	..	..	..	..	..	1
Leptospirosis	..	..	2	..	..	..	..	..	2
Malaria	..	..	..	..	..	..	..	..	..
Meningococcal Infection	..	1(1)	..	..	..	..	..	..	1
Ophthalmia	..	..	..	..	1	..	..	..	1
Ornithosis	..	..	..	..	..	..	..	..	..
Paratyphoid	..	..	..	..	..	..	..	..	..
Plague	..	..	..	..	..	..	..	..	..
Poliomyelitis	1	..	..	..	..	..	..	..	1
Puerperal Fever	..	..	1	1	..	..	..	..	2
Rubella	..	13(11)	..	2(1)	11(7)	..	..	..	26
Salmonella Infection	..	..	..	1(1)	1(1)	..	..	..	2
Scarlet Fever	16(4)	18(14)	3(1)	3(1)	3(3)	..	..	2	45
Smallpox	..	..	..	..	..	..	..	..	..
Tetanus	..	..	..	..	..	..	..	..	..
Trachoma	..	..	..	..	34(4)	..	..	..	34
Trichinosis	..	..	..	..	..	..	..	..	..
Tuberculosis	15(8)	5(3)	7(4)	3(2)	13(11)	2(2)	1	..	46
Typhoid Fever	..	..	..	..	2(2)	..	..	..	2
Typhus (Flea-, Mite- and Tick-borne)	..	..	..	..	..	..	..	..	..
Typhus (Louse-borne)	..	..	..	..	..	..	..	..	..
Yellow Fever	..	..	..	..	..	..	..	..	..

[1] Figures in parentheses are those for the metropolitan area.

Notice.

BRITISH MEDICAL ASSOCIATION, VICTORIAN BRANCH.

Section of Preventive Medicine.

A MEETING of the Section of Preventive Medicine of the Victorian Branch of the B.M.A. will be held in the Medical Society Hall, 426 Albert Street, East Melbourne, on Thursday, May 8, 1958, at 4.30 p.m. Dr. Alan Stoller, of the Mental Hygiene Authority, will speak on "The Problem of Alcoholism". All interested are invited to attend.

Congresses.

PAN-PACIFIC REHABILITATION CONFERENCE.

THE Pan-Pacific Rehabilitation Conference is to be held in Sydney in November, 1958. This will be a regional conference of the International Society for the Welfare of Cripples and the first gathering of its kind to be held in the Southern Hemisphere. The President of the International Society for the Welfare of Cripples, Sir Kenneth Coles, is a resident of Sydney, and the Secretary-General, Mr. Donald Wilson, will come from New York. The host organization for the conference is the Australian Advisory Council for the Physically Handicapped. This Council has set up an executive committee in Sydney under the chairmanship of Dr. Walter Wearn and a medical committee under the chairmanship of Dr. Selwyn Nelson, advising on the programme planning. Also on the medical committee are members of the British Medical Association, Australian Orthopædic Association, Post-Graduate Committee in Medicine in the University of Sydney, Royal Australasian College of Surgeons, Commonwealth Department of Social Services and other members of the medical profession. The conference will deal mainly with the problems of the orthopædically handicapped, and will include, to a far lesser extent, the problems of the blind and the deaf. The conference should be of interest to members of the medical profession, those who work in associated fields, education authorities and public officers dealing with problems of vocational training and employment.

INTERNATIONAL CONGRESS OF HISTORY OF MEDICINE.

THE sixteenth International Congress of History of Medicine will take place at the Faculty of Medicine of Montpellier from September 22 to 28, 1958, under the general presidency of Monsieur le Doyen Giraud, dean of that faculty. The following subjects have been selected for attention: (i) Connexions between the School of Montpellier and the medical institutions of various countries along the centuries. (ii) History and expansion of hospital establishments. (iii) Medical iconography during the seventeenth century. (iv) The New World's contribution to therapeutics. (v) Varia.

Further information may be obtained from Professor Turchini, President of the Organization Committee, Faculty of Medicine, Montpellier (Hérault), France.

Nominations and Elections.

THE undermentioned has applied for election as a member of the New South Wales Branch of the British Medical Association:

Pegum, Brian Francis, M.B., B.S., 1957 (Univ. Sydney). 762 New South Head Road, Rose Bay, New South Wales.

The undermentioned have been elected as members of the New South Wales Branch of the British Medical Association: Evans, William Anwyl, M.B., B.S., 1958 (Univ. Sydney); Ferry, Anne Agatha, M.B., B.S., 1958 (Univ. Sydney); Williams, Ronald George, M.B., B.S., 1958 (Univ. Sydney); Ackerman, Valetine Peter, M.B., B.S., 1957 (Univ. Sydney); Melov, John, M.B., B.S., 1957 (Univ. Sydney); Bell, Sydney Malcolm, M.B., B.S., 1956 (Univ. Sydney); Booth, Elizabeth Marie Joan, M.B., B.S., 1956 (Univ. Sydney); Degotardi, Lynette Florence, M.B., B.S., 1956 (Univ. Sydney); McCauley, Anthony John Bede, M.B., B.S., 1956 (Univ. Sydney); Monaghan, William, M.B., B.S., 1956 (Univ. Sydney); Shellshear, Michael Francis, M.B., B.S., 1955 (Univ. Sydney); Whelan, James Joseph, M.B., B.S., 1955 (Univ. Sydney); White, Francis David, M.B., B.S., 1952 (Univ. Sydney); Joffick, Solomon David, M.D., 1917 (Univ. Yuriev), registered under Section 17 (2*a*) of the *Medical Practitioners Act*, 1938-1957.

Deaths.

THE following death has been announced:

RICH.—Vivian Morris Rich, on April 17, 1958, at Woollahra, New South Wales.

Diary for the Month.

MAY 1.—South Australian Branch, B.M.A.: Branch Council Meeting.
MAY 2.—Queensland Branch, B.M.A.: General Meeting.
MAY 6.—New South Wales Branch, B.M.A.: Organization and Science Committee.
MAY 7.—Western Australian Branch, B.M.A.: Branch Council.
MAY 8.—New South Wales Branch, B.M.A.: Public Relations Committee.
MAY 9.—Tasmanian Branch, B.M.A.: Branch Council.
MAY 9.—Queensland Branch, B.M.A.: Council Meeting.
MAY 13.—New South Wales Branch, B.M.A.: Executive and Finance Committee.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales. Anti-Tuberculosis Association of New South Wales.

South Australian Branch (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

Editorial Notices.

ALL articles submitted for publication in this Journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given: surname of author, initials of author, year, full title of article, name of journal, volume, number of first page of the article. The abbreviations used for the titles of journals are those adopted by the Quarterly Cumulative Index Medicus. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors submitting illustrations are asked, if possible, to provide the originals (not photographic copies) of line drawings, graphs and diagrams, and prints from the original negatives of photomicrographs. Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary is stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2-3.)

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